NINETEENTH ANNUAL REPORT

OF THE

Sanitary Commissioner for the Government of Bombay,

1882, & 1883

WITH

APPENDICES.

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GENERAL POPULATION AND VITAL STATISTICS.

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ANNUAL SANITARY REPORT FOR 1882.

SECTION I.

GENERAL POPULATION AND VITAL STATISTICS.

Standard table for reference.

1. It is thought that the report will be more complete if prefaced by a table showing the area of the several Registration Divisions and Districts, together with the enumerated population for each, and its density. Such a table is here appended, and it is proposed to repeat it every year for general reference. It will be seen that by the census taken on the night of the 17th February 1881, the total population of the districts named was 16,454,414, thus made up:—

8,497,718 males.
7,956,696 females.

16,454,414

Densities.

2. The total area is 123,860 square miles, and the average numbers per square mile are 132·85. The densities range from 15·98 in Thar and Párkar to 35,145·27 in the city of Bombay; but excluding this terribly overcrowded city, and the sparsely peopled Province of Sind, the general average for the other districts is 174·37 persons per square mile.

Table showing for the Districts named, the area, the enumerated population by the Census of 17th February 1881, and the number of persons per square mile.

Divisions.	No.	Registration Districts.	Area in square miles	Enumerated Population.			Persons per square mile.
				Males.	Females.	Persons.	
Northern Deccan.	1	Khándesh	9,944	632,468	604,763	1,237,231	124·42
	2	Násik	5,940	397,404	383,802	781,206	131·51
	3	Ahmednagar	6,666	381,602	369,626	751,228	112·69
	4	Poona	5,348	455,101	445,526	900,621	168·40
	5	Sholápur	4,521	294,814	287,673	582,487	128·84
Southern Deccan.	6	Sátára	4,988	532,525	529,825	1,062,350	212·98
	7	Belgaum	4,657	434,485	429,529	864,014	185·53
	8	Dhárwár	4,535	442,035	440,872	882,907	194·68
	9	Kaládgi	5,757	317,611	320,882	638,493	110·90
Konkan.	10	Kánara	3,911	223,005	198,835	421,840	107·85
	11	Ratnágiri	3,922	473,053	524,037	997,090	254·22
	12	Kolába	1,496	191,952	189,697	381,649	255·11
	13	Bombay City	22	464,763	308,433	773,196	35,145·27
	14	Thána	4,243	468,236	440,312	908,548	214·12
Gujarát.	15	Surat	1,662	306,015	308,183	614,198	369·55
	16	Broach	1,453	168,482	158,448	326,930	225·00
	17	Kaira	1,609	426,781	378,019	804,800	500·18
	18	Panch Mahális	1,613	131,162	124,317	255,479	158·38
	19	Ahmedabad	3,821	439,394	416,930	856,324	224·10
Sind.	20	Karáchi	14,115	265,988	212,700	478,688	33·87
	21	Hyderabad	9,030	407,243	347,381	754,624	83·57
	22	Thar and Párkar ...	12,729	112,400	90,944	203,344	15·98
	23	Shikárpur	10,001	461,033	391,953	852,986	85·29
	24	Upper Sind Frontier ...	1,877	70,166	54,015	124,181	66·16

ABSTRACT.

Northern Deccan ...	32,419	2,161,389	2,091,384	4,252,773	131·18
Southern Deccan ...	19,937	1,726,656	1,721,108	3,447,764	172·93
Konkan	13,594	1,821,009	1,661,314	3,482,323	256·17
Gujarát	10,158	1,471,834	1,385,897	2,857,731	281·33
Sind	47,752	1,316,830	1,096,993	2,413,823	50·55
The Presidency ...	123,860	8,497,718	7,956,696	16,454,414	132·85

Note.—This table includes the military population, which is 35,660.

BIRTHS.

Number of registered Births.

3. The number of births registered in 1882 was 491,346, and of these births 255,927 were male and 235,419 were female. In 1881 the registered total was 459,657, and by sexes the numbers were, respectively, 239,912 and 219,745. For the 9 years from 1872 to 1880 inclusive the mean registered total is 310,004; thus made up 163,194 males and 146,810 females. The total births for 1882 is higher by 31,689 than that for 1881, and it exceeds by 181,342 the mean total for the previous 9 years.

Birth-rate.

4. The general birth-rate for the year was 29·86 per 1,000 of population. For male births it was 30·12, and for female 29·59. In 1881 the general birth-rate was 27·93. For males it was 28·23 and for females 27·62. The general annual mean for the previous 9 years ending with 1880 is 19·10 per 1,000 of population enumerated at the census of 1872. It will be seen that the general birth-rate for 1882 is higher by 1·93 than that for 1881, and it also exceeds by 10·76 the mean rate for the previous 9 years ending with 1880. It is satisfactory to notice here the general improvement in the registration of births generally. The proportion of male to female children born was 108·71 to 100; last year it was 109·18, and the mean total for the previous 9 years was 111·16. In every 100 births there were 52·09 males and 47·91 females, and for every 100 males there were 91·98 females. In 1881 there were 91·59 females for every 100 males, and the mean for the previous 9 years was 89·96. The following table shows, for the 11 years from 1872 to 1882 inclusive, the registered number of births in each year, their ratios to population, and the proportion of males to females. The results for 1882 are contrasted with those for 1881 and the corresponding means of the preceding 9 years:—

Years.	Number of Births registered.			Ratio per 1,000 of Population.			In every 100 Births there were		For every 100 Male Births the Female were
	Males.	Females.	Persons.	Males.	Females.	Persons.	Males.	Females.	
1872	140,644	126,299	266,943*	18·95	18·46	17·56	52·69	47·31	89·80
1873	152,520	137,799	290,319*	17·97	17·78	17·88	52·54	47·46	90·35
1874	174,986	157,842	332,808	20·69	20·44	20·57	52·57	47·43	90·21
1875	178,892	161,937	340,829	21·15	20·97	21·06	52·49	47·51	90·52
1876	181,872	163,612	345,484	21·50	21·18	21·35	52·64	47·36	89·96
1877	164,202	147,309	311,661	19·40	19·06	19·26	52·75	47·25	89·73
1878	128,848	114,405	243,253	15·25	14·81	15·04	52·97	47·03	88·79
1879	151,460	136,410	287,870	17·86	17·69	17·74	52·61	47·39	90·06
1880	180,285	175,588	370,873	23·02	22·67	22·85	52·66	47·34	89·91
Mean for 9 years ...	163,194	146,810	310,004	19·28	18·95	19·10	52·64	47·36	89·96
1881	239,912	219,745	459,657	28·23	27·62	27·93	52·19	47·81	91·59
1882	255,927	235,419	491,346	30·12	29·59	29·86	52·09	47·91	91·98

* *N. B.*—Inclusive of still-born.

Ratios from 1872 to 1880 are calculated on the population enumerated at the census of 1872. Ratios for 1881 and 1882 are calculated on the population enumerated at the census of 1881.

Comparison between the number of births registered in each division and district for 1882 with the number for 1881 and the means for the preceding 9 years.

5. The next table shows for each division and district the number of births registered from 1872 to 1882. The results for 1882 are shown in contrast with those for 1881, together with the annual means and ratios for the previous 9 years:—

Division.	No.	Registration Districts.	Population according to Census of 1881.	Births by Districts. 1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	Total.	For 9 Years. Mean Annual Number of Births.	Mean Ratio per 1,000 of Population as Census of 1872.	Births in 1881.	Ratio per 1,000 of Population as Census of 1881.	Births in 1882.	Ratio per 1,000 of Population as Census of 1881.
Northern Deccan.	1	Khándesh	1,237,231	15,746	16,094	20,762	20,224	23,257	23,364	20,374	25,504	20,752	196,077	21,786	21·18	29,827	32·20	43,114	34·85
	2	Násik	781,206	13,037	14,306	18,628	19,953	19,097	17,670	15,431	20,501	22,992	161,595	17,955	24·45	23,195	29·70	27,473	35·17
	3	Ahmednagar	731,228	12,468	18,369	23,330	24,294	24,427	16,808	12,113	18,968	20,086	170,863	18,985	24·53	24,313	31·03	29,386	39·12
	4	Poona	900,621	16,461	18,441	19,906	21,214	19,617	15,132	11,740	15,139	18,199	155,869	17,319	19·09	21,578	23·96	24,754	27·48
	5	Sholápur	382,487	8,114	12,238	15,093	14,785	16,545	9,155	6,769	6,718	8,559	97,976	10,886	15·16	17,256	29·62	20,138	34·37
Southern Deccan.	6	Sátára	1,062,350	23,089	23,434	31,033	30,150	28,334	23,064	18,725	27,093	31,914	239,416	26,602	25·07	37,334	35·14	41,497	39·06
	7	Belgaum	864,014	17,609	19,845	24,912	20,257	27,563	22,425	11,772	19,170	24,184	197,738	21,971	23·40	31,015	35·90	32,477	37·59
	8	Dhárwár	882,907	28,866	28,477	25,371	27,794	28,568	21,203	9,966	16,927	28,456	218,628	24,292	24·59	33,315	37·73	36,257	41·06
	9	Kaládgi	638,403	13,742	13,500	18,633	16,156	18,581	11,467	2,795	6,798	10,825	112,499	12,500	15·32	19,380	30·67	22,678	35·32
Konkan.	10	Kánara	421,840	11,408	12,307	12,547	11,677	11,728	11,731	8,057	9,382	12,873	101,910	11,323	28·45	13,254	31·44	12,625	29·93
	11	Ratnágiri	997,090	12,410	15,389	14,987	16,473	16,451	15,710	13,804	13,609	12,483	131,016	14,557	14·28	16,200	16·45	20,922	20·68
	12	Kolába	381,649	3,975	4,228	4,804	5,518	5,339	5,616	6,043	7,351	7,624	50,498	5,611	16·01	8,153	21·36	9,178	24·05
	13	Bombay City	773,196	13,600	13,179	12,659	13,243	13,466	13,720	13,896	14,341	16,997	129,051	13,895	21·56	16,381	21·19	15,094	19·52
	14	Thána	908,548	14,818	17,318	16,725	18,803	16,773	18,804	16,464	20,442	23,461	163,608	18,179	21·45	26,442	29·10	25,898	28·50
Gujarát.	15	Surat	614,198	12,995	11,449	13,961	15,342	13,583	15,052	14,965	13,962	15,897	126,217	14,024	23·10	21,667	35·28	21,833	35·55
	16	Broach	326,930	4,425	4,553	5,721	5,749	5,688	7,273	6,271	4,177	5,861	49,720	5,524	15·77	10,033	30·69	9,342	28·58
	17	Kaira	804,800	14,012	15,622	15,893	16,124	18,158	19,995	15,728	17,587	24,415	157,234	17,470	22·32	30,174	37·49	26,441	32·85
	18	Panch Mahals	255,479	2,923	3,089	3,829	4,623	4,615	5,618	4,464	2,468	7,970	39,599	4,400	18·28	8,226	40·03	6,813	26·67
	19	Ahmedabad	856,324	13,886	15,467	15,909	15,504	16,623	18,822	16,225	15,321	17,834	145,591	16,177	19·30	24,912	29·09	23,392	27·32
Sind.	20	Karáchi	478,688	3,012	2,724	3,652	3,504	4,533	3,793	3,332	3,390	7,907	35,847	3,983	9·40	8,575	17·91	9,571	20·02
	21	Hyderabad	754,624	5,092	3,814	4,506	3,893	5,158	5,249	5,078	3,950	7,659	44,399	4,922	6·42	9,398	12·45	8,767	11·62
	22	Thar and Párkar	203,344	108	316	886	734	1,298	3,345	3,439	1,451	4,689	16,266	1,807	10·00	5,492	27·01	5,061	24·89
	23	Shikárpúr	852,986	5,133	4,217	5,152	4,210	5,354	5,301	5,130	3,882	8,511	46,390	5,210	6·71	12,389	14·52	17,330	20·32
	24	Upper Sind Frontier ...	124,181	194	293	907	645	728	722	671	738	734	5,632	626	6·96	938	7·55	1,305	10·51

ABSTRACT.

	1	Northern Deccan ...	4,252,773	65,826	79,448	97,719	100,450	102,943	82,149	66,427	86,830	100,588	782,380	86,921	20·80	126,169	29·67	144,865	34·06
	2	Southern Deccan ...	3,447,764	83,306	87,256	102,951	104,337	103,046	78,759	43,259	69,988	95,379	768,281	83,364	22·44	121,244	35·17	132,909	38·55
	3	Konkan	3,482,323	56,211	62,071	61,722	63,714	63,757	63,581	58,264	65,225	73,438	572,083	63,565	19·50	80,440	23·10	83,417	23·95
	4	Gujarát	2,837,731	48,151	50,180	55,313	57,342	58,667	60,762	57,653	52,316	71,977	518,361	57,596	20·49	95,012	33·23	87,821	30·73
	5	Sind	2,413,823	13,449	11,364	15,103	12,986	17,071	18,410	17,650	13,411	23,491	148,935	16,548	7·35	26,792	12·24	42,334	17·84
		Total Presidency ...	16,454,414	266,943	290,319	332,808	340,829	345,484	311,661	243,253	287,870	370,873	2,790,040	310,004	19·10	459,657	27·93	491,346	29·86

N.B.—Still-born were included in 1872 and 1873.

The above table shows improved registration in 1881 and 1882. The number of births registered in these two years in each division and district exceeds the mean number for the previous 9 years. But taking the number registered for each division in 1882, and comparing it with that for 1881, it will be seen that in 4 out of 5 divisions the number recorded in this year is higher than that for last year. The one that represents the lower number is Gujarát. In this division, with the exception of the Surat District, in which an insignificant increase of 166 births took place during the year under review, all other districts show less number this year than in the previous year. By districts it will also be seen that in 15 out of 24 districts the number registered for this year is higher than that for 1881. The districts in which less number were registered are:—Kánára 12,625 against 13,264, Bombay City 15,094 against 16,381, Thána 25,898 against 26,442, Broach 9,342 against 10,033, Kaira 26,441 against 30,174. Panch Mahals 6,813 against 8,226, Ahmedabad 23,392 against 24,912, Hyderabad 8,767 against 9,398, and Thar and Párkar 5,061 against 5,492.

Diagram showing the Number of Births by Districts.

6. The diagram given shows for each district the mean number of births for 9 years ending with 1880 and the number registered in 1881 and 1882.

Birth-rate in Districts.

7. In the subjoined table there are given the number of births registered in each district in 1882 and their ratios per 1,000 of population, and the numbers and ratios are contrasted with those for 1881. The highest rate (41·06) is for Dhárwár, and the lowest (10·51) for the Upper Sind Frontier. In 1881 the highest ratio (40·03) was in Panch Mahals and the lowest (7·55) in Upper Sind Frontier. It will be seen that in Kaira, Kánara, Broach, Thána, Ahmedabad, Panch Mahals, Thar and Párkar, Bombay City and Hyderabad the recorded rates for this year are below those for last year. In all other districts the ratios are higher:—

No.	Registration Districts.	Number of Births registered.		Ratio per 1,000 of Population.	
		1882.	1881.	1882.	1881.
1	Dhárwár	36,257	33,315	41·06	37·73
2	Ahmednagar	29,386	24,318	39·12	31·03
3	Sátára	41,497	37,334	39·06	35·14
4	Belgaum	32,477	31,015	37·59	35·90
5	Surat	21,833	21,667	33·55	35·28
6	Kaládgi	22,678	19,580	35·52	30·67
7	Násik	27,473	23,195	35·17	29·70
8	Khándesh	45,114	39,827	34·85	32·20
9	Sholápur	20,138	17,256	34·57	29·62
10	Kaira	26,441	30,174	32·85	37·49
11	Kánara	12,625	13,264	29·93	31·44
12	Broach	9,342	10,033	28·58	30·69
13	Thána	25,898	26,442	28·50	29·10
14	Poona	24,754	21,578	27·48	23·96
15	Ahmedabad	23,392	24,912	27·32	29·09
16	Panch Mahála	6,813	8,226	26·67	40·03
17	Thar and Párkar	5,061	5,492	24·89	27·01
18	Kolába	9,178	8,153	24·05	21·36
19	Ratnágiri	20,622	16,200	20·68	16·45
20	Karáchi	9,871	8,575	20·62	17·91
21	Shikárpur	17,330	12,389	20·32	14·52
22	Bombay City	15,094	16,381	19·52	21·19
23	Hyderabad	8,767	9,398	11·62	12·45
24	Upper Sind Frontier	1,305	938	10·51	7·55
	Total for the year ...	491,346	459,657	29·86	27·93

Birth and Death-rates compared by Districts.

8. It will be seen from the following table that in Bombay City, Hyderabad and Shikárpur the birth-rates are lower than the death-rates in this year; in all other districts they are higher. In 1881 the birth-rates were lower than the death-rates in Bombay City, Hyderabad, Broach, Ahmedabad and Karáchi. In 22 out of 24

Diagram

showing for each District the total number of births registered in 1852 compared with the total for 1851 and the mean for the preceding 5 years ending with 1852

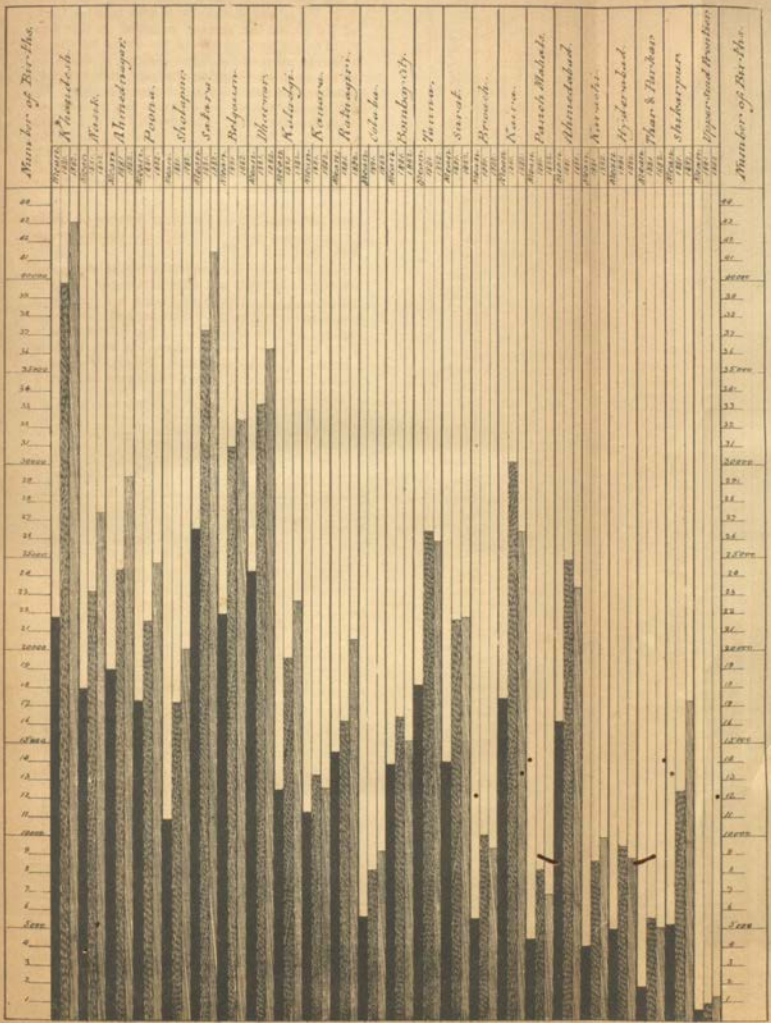

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Diagram

showing births and deaths from 1872 to 1880 inclusive and for 1881/1882 together with the mean for 9 years.

B.-387.

Photozincographed, Genl Office, Perth, 1883.

districts the mean annual birth-rate for the 9 years ending with 1880 is below the mean annual death-rate for the same period. The most notable instances in this year as regards birth-rates higher than the death-rates are—in Ahmednagar they are, respectively, 39·12 and 19·51, in Sholápur 34·57 and 18·99, in Sátára 39·06 and 22·62, in Dhárwár 41·06 and 22·58, and in Kaládgi 35·52 and 19·10. For the Presidency the birth and death-rates are, respectively, 29·86 and 20·87. Prior to this year only thrice—in 1874, 1880 and 1881—has the birth-rate exceeded the death-rate :—

Districts.	Population according to Census of 1881.	Births.			Deaths.			Births.		Deaths.		Births.		Deaths.	
		Total from 1872 to 1880.	Mean for 9 years.	Ratio per 1,000 of Population calculated at the Census of 1872.	Total from 1872 to 1880.	Mean for 9 years.	Ratio per 1,000 of Population calculated at the Census of 1872.	In 1881.	Ratio per 1,000 of Population calculated at the Census of 1881.	In 1881.	Ratio per 1,000 of Population calculated at the Census of 1881.	In 1882.	Ratio per 1,000 of Population calculated at the Census of 1882.	In 1882.	Ratio per 1,000 of Population calculated at the Census of 1882.
Khándesh	1,827,231	296,077	32,780	21·18	205,041	22,882	22·25	39,837	19·23	30,661	34·78	43,114	34·85	27,304	22·07
Nasik	781,206	161,355	17,950	24·45	161,168	18,013	24·52	36,196	29·79	31,562	37·90	37,478	30·17	19,349	24·77
Ahmednagar	752,236	147,108	16,345	24·52	178,967	19,885	29·83	32,993	29·31	31,370	39·12	30,586	29·12	14,658	19·51
Poona	900,625	155,009	17,333	19·99	187,483	20,829	23·95	31,378	23·98	19,757	21·94	34,734	27·45	16,971	17·84
Sholápur	582,467	97,970	10,886	13·76	105,549	11,683	20·74	17,206	20·62	12,651	21·73	20,139	24·37	11,003	18·99
Sátára	1,002,355	230,415	26,002	25·07	204,169	22,685	22·62	37,814	24·76	22,676	22·62	41,497	27·66	24,000	23·42
Belgaum	994,614	197,788	21,971	22·40	281,225	31,250	31·29	33,015	20·90	30,133	29·30	34,477	27·50	30,351	29·17
Dhárwár	581,962	218,698	24,292	34·29	160,366	18,710	34·07	28,215	37·79	20,402	39·05	25,257	41·96	16,908	32·05
Kánara	628,440	112,498	12,500	15·22	221,105	24,567	30·10	19,580	20·07	13,547	21·27	22,076	34·59	13,192	19·16
Kaládgi	421,840	101,919	11,324	24·45	119,738	13,304	32·69	15,984	31·44	12,091	29·06	12,625	29·02	10,503	23·61
Ratnágiri	907,686	191,916	14,657	14·78	154,100	17,011	18·74	18,000	17·35	15,000	15·63	20,822	21·46	15,000	17·06
Kolába	261,687	59,498	5,611	16·01	49,888	5,432	15·60	6,153	21·26	7,723	29·23	9,178	34·83	7,371	19·02
Bombay City	773,196	170,953	13,960	22·06	192,367	21,484	30·20	18,261	19·14	21,353	27·97	15,084	19·13	20,220	29·16
Thána	806,846	169,606	18,179	21·45	168,084	18,723	22·69	26,442	29·19	20,139	23·20	25,686	29·50	20,671	22·99
Surat	654,196	138,217	14,024	23·10	147,822	16,369	26·96	21,662	20·26	21,112	34·97	21,830	29·56	14,062	22·41
Broach	326,555	69,730	5,524	15·77	87,884	9,759	27·71	12,014	23·04	12,899	33·93	8,347	22·00	8,664	29·4
Kaira	804,800	157,294	17,479	22·29	191,325	21,269	27·90	30,174	27·48	25,904	32·26	26,441	29·85	17,970	22·7
Panch Mahals	253,472	39,526	4,400	13·29	65,209	6,434	22·57	8,226	40·03	4,432	17·48	6,852	29·07	4,983	19·08
Ahmedabad	856,334	145,031	16,117	19·09	212,451	23,604	28·48	34,913	29·99	26,707	30·12	25,905	27·22	20,784	24·29
Kaira	478,696	85,847	9,983	9·40	57,841	6,427	15·18	8,575	17·91	8,971	19·74	9,971	20·42	9,867	18·45
Hyderabad	754,604	44,598	4,955	6·42	72,577	8,841	11·74	8,200	12·45	5,000	12·35	9,787	11·92	11,666	14·08
Thar and Párkar	203,344	16,208	1,801	10·00	16,158	1,795	9·93	5,402	27·91	3,435	16·99	5,981	24·69	3,498	17·20
Shikárpur	350,000	46,990	5,210	6·71	71,985	7,998	10·18	15,260	14·52	8,871	19·17	17,326	29·12	17,869	29·92
Upper Sind Frontier	134,181	5,813	626	6·96	6,847	761	9·45	938	7·32	815	6·56	1,205	10·51	1,230	9·99
Total	16,454,414	3,290,040	333,604	19·10	3,957,533	395,281	24·25	410,557	27·97	361,450	23·16	431,546	29·86	345,418	20·87

Diagram showing the number of births and deaths in each year from 1872 to 1882.

9. The diagram on opposite page shows births and deaths in each year from 1872 to 1882. The mean for 9 years from 1872 to 1880 is contrasted with those for 1881 and 1882.

Birth-rates in principal towns compared with their death-rates.

10. The subjoined list of 24 principal towns gives their enumerated population by the census of 1881 ; their birth and death-rates per 1,000 of population for this year are contrasted with those for 1881 :—

No.	Names of Towns.	Population according to Census of 1881.	1882.		1881.	
			Birth-rate per 1,000.	Death-rate per 1,000.	Birth-rate per 1,000.	Death-rate per 1,000.
1	Karáchi	68,332	43·68	25·51	35·20	21·00
2	Dhárwár	27,191	42·29	24·05	39·20	19·23
3	Násik	23,766	42·08	41·07	34·88	46·62
4	Ahmedabad ...	122,820	41·13	41·20	41·74	55·47
5	Surat	109,844	37·98	24·42	27·42	38·32
6	Kárwár	13,761	35·17	20·20	37·79	20·20
7	Sátára	29,028	32·70	21·53	32·07	25·21
8	Kaládgi	7,024	32·46	22·21	38·44	21·21
9	Kaira	12,640	32·36	31·72	35·44	39·56
10	Ahmednagar ...	32,798	30·88	36·16	41·98	54·91
11	Alibág	6,376	24·15	21·80	11·45	17·88
12	Sholápur	59,633	23·71	25·01	18·43	29·36
13	Vengarla	8,947	23·70	25·60	23·47	20·12
14	Shikárpur	42,496	21·98	21·49	29·39	26·76
15	Bombay City ...	773,196	19·52	26·16	21·19	27·87
16	Hyderabad... ...	45,195	19·45	28·83	31·09	24·41
17	Poona City... ...	99,622	19·01	21·79	19·28	25·47
18	Thána	14,456	17·71	16·74	16·29	20·27
19	Belgaum	23,115	15·96	16·66	21·20	24·10
20	Godhra	13,342	14·54	13·34	20·98	20·39
21	Umarkot	2,828	13·44	50·21	23·34	53·04
22	Jacobabad	11,352	12·95	15·59	14·89	21·32
23	Broach	37,281	7·96	13·38	11·53	20·14
24	Dhulia	18,449	6·61	15·12	6·67	12·57

It will be seen that in 12 out of 24 principal towns the birth-rate exceeds the death-rate in this year; in 1881 it exceeded in 9. On comparing the birth-rates for this year with that for 1881 it appears that in 15 out of 24 principal towns the birth-rate is lower this year than it was in 1881. The most notable instances of low birth-rates are at Ahmednagar 30·88 against 41·98, Shikárpur 21·98 against 29·39, Bombay City 19·52 against 21·19, Hyderabad 19·45 against 31·09, Belgaum 15·96 against 21·20, Godhra 14·54 against 20·98, Umarkot 13·44 against 23·34, and Broach 7·96 against 11·53. This is not the first time that I speak of the worthlessness of these returns, but have repeatedly remarked in my annual reports for past years of their utter worthlessness; and as they were then so they are now, grossly incorrect and grossly inconsistent. It is most disappointing to find again that the city of Bombay is still backward in birth registration, though it has an increased registration establishment working under its authority for upwards of 2 years. It will also be worth while noticing here the remarks made by the Deputy Sanitary Commissioners, Northern Deccan, Gujárat and Sind Registration Districts, in order to corroborate the statement so often made in my Annual Sanitary Reports for past years of the utter worthlessness of these records. The Deputy Sanitary Commissioner, Northern Deccan Registration District, remarks in his Annual Report for this year that "the first four on the list are of Khándesh; look at Dhulia, its "chief town, representing its birth-rate at 6·61 and death-rate at 15·12; could "any thing be more utterly ridiculous? Násik and Yeola, towns of the former "zilla, are much better; but it is impossible to accept their figures as valid. "The birth-rate of Ahmednagar town is again below its death-rate. To pass on "to Poona Zilla, its chief town is at an apparent standstill; its figures are use-"less, and not a bit better than last year." As regards the Broach town the Deputy Sanitary Commissioner, Eastern Gujarát Registration District, says: "In Broach no improvement is seen; but, on the other hand, the birth-rate has "fallen from 11 to 7 per thousand, showing an amount of neglect in registration "which seriously demands the immediate attention of the authorities." The Deputy Sanitary Commissioner, Sind Registration District, remarks: "That "they (birth and death registers) are irregularly and incorrectly kept, cannot, "therefore, be wondered at; and as the Government of India are not willing to "resort to legislation for the purpose of rendering registration compulsory, "something should be done to improve the system as it exists at present, or at "least to make it operative, for the clause—*registers are constantly scrutinized, "and any default on the part of a patel to register a birth or death which is "discovered is punished*—is not applicable to Sind."

Birth-rate in Cantonments.

11. The birth-rates in 5 out of 7 Cantonments are lower than their death-rates. The higher birth-rates are at Devlali and Málegaon 30·39 against 20·26 and 47·35 against 36·51 respectively. The lower birth-rates than the death-rates are—at Ahmednagar it was 13·63 against 16·61, for Poona 7·36 against 17·92, for Kirkee 8·41 against 11·31, for Belgaum 7·51 against 12·73, and for Ahmedabad 7·71 against 13·96.

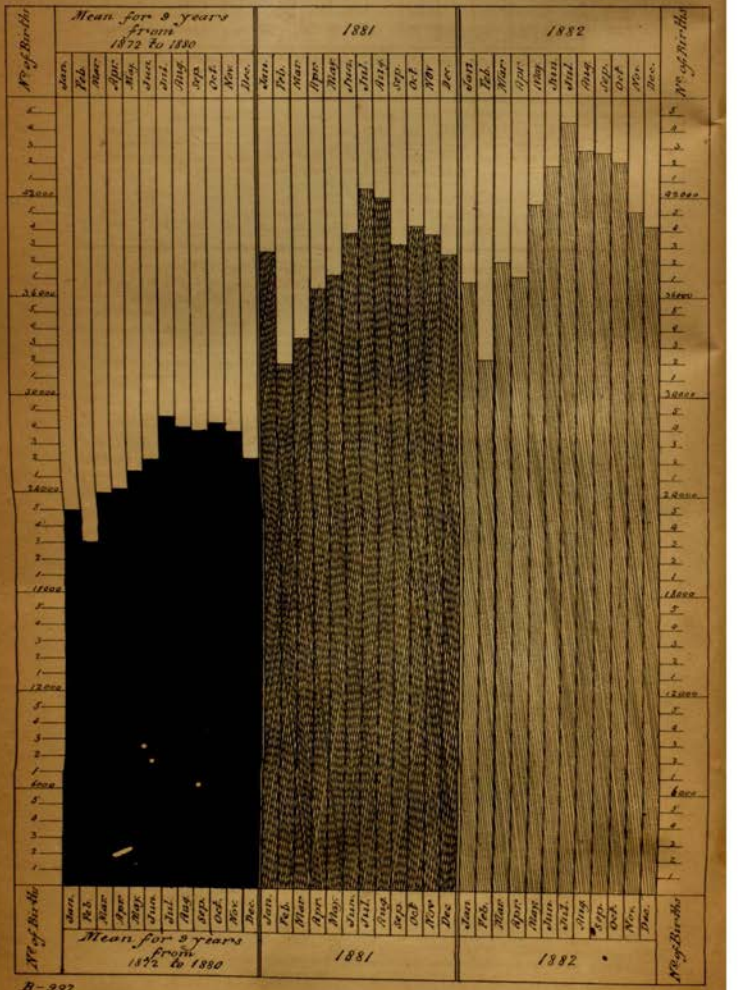
Births by Months.

12. The following table gives the births by months for each year since 1872. In 1882 the greatest number (46,487) occurred in July and the least (32,225) in February. In 1881 the extremes were in the same months—42,482 and 31,862. The mean for 9 years ending with 1880 shows that the maximum (28,541) and the minimum (21,117) were registered in these months:—

Years.	Births by Months.												Remarks.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	
1872	21,902	21,692	20,710	21,702	22,208	22,506	24,017	23,201	22,415	22,109	22,609	22,301	266,343	Inclusive of still born.
1873	23,215	17,884	20,090	21,027	23,452	24,709	27,774	28,440	26,491	27,216	27,358	25,856	296,713	
1874	24,228	21,404	24,621	24,712	26,643	25,756	30,669	31,890	30,321	31,748	29,349	27,100	329,641	
1875	29,852	24,459	25,014	26,962	29,914	29,007	31,262	29,406	31,439	27,453	26,502	25,312	346,582	Exclusive of still born.
1876	24,374	23,014	26,007	27,403	26,643	26,106	29,302	31,038	31,220	30,992	29,729	27,077	342,454	
1877	24,908	22,446	27,622	27,796	30,479	28,876	29,490	25,302	24,854	24,480	21,321	23,028	311,621	
1878	19,825	17,460	18,502	19,094	19,925	17,530	20,928	22,413	22,276	22,178	22,774	21,894	243,009	Inclusive of still born.
1879	18,359	16,516	18,502	19,435	20,755	23,248	25,884	27,515	29,809	31,503	29,561	27,776	287,479	
1880	21,700	24,443	27,557	27,346	26,600	28,649	32,671	28,482	24,514	25,961	26,909	30,119	276,872	
Total	208,563	190,003	218,715	217,476	227,737	234,388	256,809	251,691	255,356	254,325	249,687	234,700	2,700,940	

Diagram

Showing the number of births in each month in 1882 contrasted with each month in 1881 and the mean in each month for the preceding 9 years ending with 1880



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Photozincographed, Genl. Office, Perth, 1883

Years.	Deaths by Months.												Remarks.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	
Means for 9 years ...	22,994	21,117	23,969	24,164	25,302	26,026	25,541	27,559	27,321	28,161	27,742	29,602	310,004	
Ratio per 1,000 of population enumerated at the census of 1872 ...	1·42	1·30	1·48	1·49	1·56	1·60	1·57	1·72	1·71	1·74	1·71	1·81	19·10	
1882	31,623	31,962	33,426	26,364	27,721	29,849	27,402	42,026	29,157	40,300	29,785	32,805	381,450	Early area of civil birth.
Ratio per 1,000 of population enumerated at the census of 1881.	2·35	1·94	2·07	1·63	1·72	1·85	1·70	2·60	1·80	2·49	1·85	2·04	23·87	
1883	26,926	23,235	26,156	27,267	41,685	42,878	40,457	44,797	44,674	44,071	41,107	40,136	401,740	Do.
Ratio per 1,000 of population enumerated at the census of 1881. ...	1·74	1·50	1·69	1·76	2·69	2·77	2·61	2·89	2·71	2·84	2·65	2·59	25·94	

13. The accompanying diagram contrasts the number of births registered by months in 1882 with the number for 1881 and the mean for the preceding 9 years ending with 1880.

Diagram showing Births by Months.

DEATHS.

14. Amongst the civil population the total deaths recorded in 1882 was 343,418. By sexes there were 181,835 of males and 161,583 of females. In 1881 the registered number was 381,450—202,166 of males and 179,284 of females. The mean number for the preceding 9 years from 1872 to 1880 was 395,281.

Deaths.

15. The computed death-rate per 1,000 of population was 20·87, and for 1881 it was 23·18. For the 9 years ending with 1880 the average was 24·35 : so for 1882 it was less by 2·31 than for 1881, and by 3·48 than the mean for the previous 9 years ending with 1880.

Death-rate.

16. The ratio of males dying to males living was 21·40, and of females dying to females living it was 20·31. In 1881 these ratios were 23·79 and 22·53 respectively. For every 100 females who died, there died 112·53 males. These proportions vary in several districts, and chiefly in Sind, except in Shikárpur, thus :—

Male and Female Death-rates.

Khándesh	115·11	males to 100 females.
Kánara	113·84	,, ,,
Kolába	115·80	,, ,,
Broach	115·13	,, ,,
Kaira	119·92	,, ,,
Panch Mahals	117·76	,, ,,
Ahmedabad	116·57	,, ,,
Karáchi	132·19	,, ,,
Hyderabad	134·34	,, ,,
Thar and Párkar	133·20	,, ,,
Upper Sind Frontier	146·49	,, ,,

17. The following table shows, for each division of the Presidency, the enumerated population according to the census of 1881, the deaths for the year, and their ratios per 1,000 of

Deaths by Divisions.

population. The highest ratio is for Gujarát, and the lowest for Sind; but in all the divisions except Sind it is lower than in 1881 :—

Divisions.	Population by Census of 1881.			Number of Deaths.			Ratio per 1,000 of Population.		
	Males.	Females.	Persons.	Males.	Females.	Persons.	Males.	Females.	Persons.
Northern Deccan ...	2,161,389	2,091,384	4,252,773	46,649	41,796	88,445	21·58	19·98	20·80
Southern do. ...	1,726,656	1,721,108	3,447,764	39,288	36,893	76,181	22·75	21·44	22·10
Konkan ...	1,821,009	1,661,314	3,482,323	38,439	34,578	73,017	21·11	20·81	20·97
Gujarát ...	1,471,834	1,385,897	2,857,731	34,081	29,357	63,438	23·16	21·18	22·20
Sind	1,316,830	1,096,993	2,413,823	23,378	18,959	42,337	17·75	17·27	17·54
Presidency ...	8,497,718	7,956,696	16,454,414	181,835	161,583	343,418	21·40	20·31	20·87

Diagram showing Deaths from 1872 to 1882.

18. The total number of deaths in each year from 1872 to 1880 inclusive is shown by the diagram on the opposite page, and the mean for that period is so placed as to contrast with the deaths for 1881 and 1882.

Deaths by Districts.

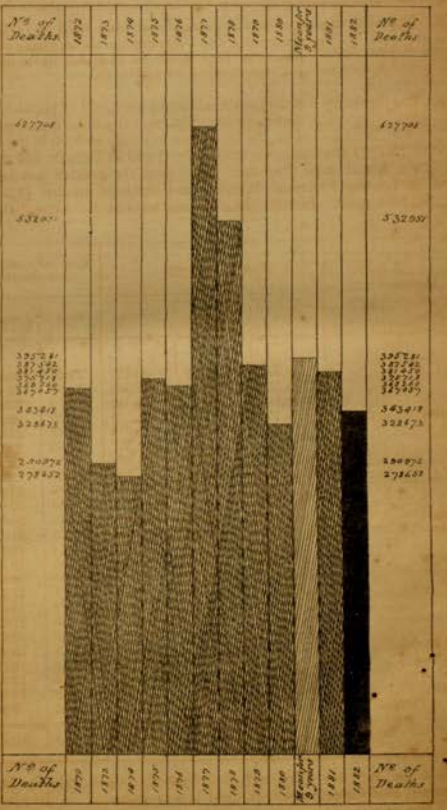
19. The deaths by districts, and their ratios per 1,000 of population, are here shown in sequence, and it will be seen that they range from 26·16 in Bombay City to 9·90 in the Upper Sind Frontier. In 1881 the maximum ratio (37·91) was in Broach, and the minimum (6·56) in the Upper Sind Frontier. This year the greater number of deaths (27,304) is for the Khándesh District, and the least number (1,230) for the Upper Sind Frontier. In 1881 the extremes were at the same districts 30,661 and 815 :—

Districts.	Number of Deaths.			Ratio per 1,000 of Population by Census of 1881.		
	Males.	Females.	Persons.	Males.	Females.	Persons.
Bombay City	10,694	9,535	20,229	23·01	30·91	26·16
Kánara	5,751	5,052	10,803	25·79	25·41	25·61
Násik	10,154	9,195	19,349	25·55	23·96	24·77
Ahmedabad	11,155	9,569	20,724	25·39	22·95	24·20
Belgaum	10,511	9,504	20,015	24·19	22·13	23·17
Surat	7,358	6,649	14,007	24·04	21·57	22·81
Sátára	12,348	11,687	24,035	23·19	22·06	22·62
Dhárwár	10,131	9,807	19,938	22·91	22·24	22·58
Kaira	9,799	8,171	17,970	22·96	21·62	22·33
Thána	10,349	9,722	20,071	22·10	22·08	22·09
Khándesh	14,611	12,693	27,304	23·10	20·99	22·07
Shikárpur	9,329	8,473	17,802	20·23	21·62	20·87
Broach	3,561	3,093	6,654	21·14	19·52	20·35
Ahmednagar	7,652	7,006	14,658	20·05	18·95	19·51
Kaládgi	6,298	5,895	12,193	19·83	18·37	19·10
Kolába	3,905	3,372	7,277	20·34	17·78	19·07
Sholápur	5,832	5,231	11,063	19·78	18·18	18·99
Karáchi	5,014	3,793	8,807	18·85	17·82	18·40
Poona	8,400	7,671	16,071	18·46	17·22	17·84
Thar and Párkar ...	1,998	1,500	3,498	17·78	16·49	17·20
Panch Mahálá	2,208	1,875	4,083	16·83	15·08	15·98
Ratnágiri	7,740	6,897	14,637	16·36	13·16	14·68
Hyderabad	6,306	4,694	11,000	15·48	13·51	14·58
Upper Sind Frontier ...	731	499	1,230	10·42	9·24	9·90
Total ...	181,835	161,583	343,418	21·40	20·31	20·87

Except for Bombay City and Shikárpur the death-rate for males every where exceeds that for females. In 1881 it was exceeded in Bombay City and Thar and Párkar.

Diagram

showing the total number of deaths from 1872 to 1880 inclusive, and the mean for this period contrasted with the total for 1881 - and 1882



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Photozincographed, Govt. Office, Poona, 1881

20. In the next table the district ratios of mortality per 1,000 of population are given by months, and they are contrasted with those for 1881 :—

Death-rates by Months.

Districts.		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Khándesh	1881	1·74	1·43	1·45	1·07	1·05	1·01	2·15	3·01	2·61	2·15	2·15	2·06	21·71
	1882	1·70	1·60	1·72	1·61	1·60	1·90	1·71	2·43	2·15	1·71	1·72	1·74	23·02
Násik	1881	2·03	1·66	1·63	1·06	1·05	1·04	2·08	3·05	2·61	2·07	2·72	2·15	27·60
	1882	2·19	1·91	1·69	1·60	1·72	1·66	1·62	2·59	2·55	2·04	2·59	2·16	24·71
Ahmednagar	1881	1·60	1·20	1·05	1·09	1·54	1·73	2·15	3·41	2·93	2·59	1·76	2·76	29·21
	1882	1·56	1·11	1·55	1·34	1·73	1·91	2·05	2·74	1·96	1·66	1·62	1·44	19·51
Poona	1881	1·26	1·05	1·21	1·30	1·39	1·45	1·77	2·67	2·71	2·13	1·97	1·74	21·34
	1882	1·22	1·25	1·32	1·39	1·61	1·41	1·71	1·75	1·97	1·53	1·64	1·67	17·56
Sholápur	1881	1·22	1·11	1·09	0·98	1·02	1·06	1·78	2·15	2·19	1·40	1·25	1·32	17·73
	1882	1·32	1·03	1·07	1·08	1·07	1·04	2·24	2·60	1·98	1·59	1·49	1·09	18·99
Sátára	1881	1·71	1·36	1·34	1·21	1·07	1·05	1·54	1·95	2·77	2·44	1·91	1·71	21·05
	1882	1·44	1·31	1·99	1·96	1·45	1·31	2·26	2·54	2·21	1·99	1·79	1·56	20·62
Belgaum	1881	1·79	1·04	1·08	1·01	1·19	1·42	1·63	1·98	1·95	1·98	1·77	1·80	19·26
	1882	1·53	1·62	1·88	1·99	2·07	2·04	2·09	2·13	2·01	1·67	1·71	1·77	20·11
Dhárwár	1881	2·78	1·85	1·90	1·74	1·34	1·45	1·96	1·91	1·67	1·77	1·91	2·06	22·20
	1882	1·96	1·83	1·91	1·97	1·84	1·86	2·04	1·91	1·69	1·71	1·88	1·93	22·19
Kaládgi	1881	1·66	1·38	1·47	1·42	1·32	1·37	1·42	1·42	1·46	1·54	1·79	2·17	21·17
	1882	1·96	1·74	1·91	1·90	1·74	1·65	1·85	2·25	1·74	1·62	1·80	2·44	22·50
Kánara	1881	2·37	2·03	2·07	2·23	1·93	1·98	2·54	2·55	2·27	2·26	2·27	2·87	29·56
	1882	2·05	2·28	2·44	1·99	1·98	1·97	2·00	2·00	1·93	1·89	1·89	2·14	25·63
Ratnágiri	1881	1·45	1·20	1·23	1·15	1·11	1·06	1·20	1·57	1·31	1·23	1·27	1·20	15·03
	1882	1·06	1·43	1·53	1·05	1·11	0·97	1·21	1·58	1·19	1·13	1·19	1·24	14·29
Kolába	1881	1·96	1·84	1·93	1·93	1·91	1·99	1·96	2·86	2·99	1·93	1·97	2·28	26·28
	1882	2·23	2·05	1·99	1·41	1·32	1·20	1·08	1·49	1·46	1·21	1·57	1·68	19·02
Bombay City	1881	2·74	2·74	2·90	2·89	2·83	2·64	2·61	2·91	2·64	2·67	2·80	2·61	32·48
	1882	2·62	2·43	2·76	2·15	2·01	1·72	1·79	2·06	2·11	2·09	2·06	2·17	26·16
Thána	1881	2·53	1·81	1·93	1·74	1·59	1·65	1·77	2·02	2·01	1·73	2·49	2·92	25·20
	1882	2·66	2·39	2·38	1·74	1·64	1·45	1·53	1·90	1·89	1·74	1·91	2·22	23·39
Surat	1881	2·42	2·24	2·28	2·27	2·41	4·22	4·80	4·15	2·58	2·47	2·46	2·55	34·35
	1882	2·35	1·94	1·96	1·64	1·71	1·92	1·77	1·85	1·97	1·90	2·45	2·22	23·51
Broach	1881	2·41	2·23	2·31	2·74	2·15	2·11	2·25	2·00	2·17	2·23	2·09	2·09	27·91
	1882	2·26	1·96	1·93	1·62	1·56	1·34	1·50	1·59	1·43	1·71	1·69	1·91	20·05
Kaira	1881	4·91	3·23	2·40	2·34	2·09	2·12	2·45	2·10	2·26	4·04	2·74	2·73	32·26
	1882	1·97	1·85	2·00	1·69	1·75	1·43	1·27	1·97	2·05	2·11	2·13	1·75	22·22
Panch Maháls	1881	1·77	1·26	1·73	1·78	1·96	1·49	1·28	1·44	1·61	1·45	1·93	1·81	17·45
	1882	1·41	0·93	1·05	1·26	1·04	0·75	0·95	1·02	1·26	1·27	2·05	1·75	13·66
Ahmedabad	1881	3·02	2·71	2·62	2·50	1·83	1·91	2·03	2·67	2·96	2·76	2·84	3·07	30·91
	1882	2·68	2·27	2·35	1·95	2·01	2·00	1·91	1·87	1·93	1·90	2·06	2·14	24·00
Karkhi	1881	2·39	2·35	2·14	1·95	1·76	1·57	1·59	1·65	1·71	1·69	1·98	2·17	19·74
	1882	2·05	1·88	2·21	1·75	1·90	1·71	1·62	1·63	1·74	1·70	1·75	1·74	21·48
Hyderabad	1881	1·32	1·08	1·30	1·35	0·90	0·73	0·63	0·66	0·76	1·14	2·00	2·08	13·25
	1882	1·64	1·06	2·05	1·47	1·01	0·54	0·60	0·61	0·75	1·14	1·39	1·56	14·56
Thar and Párkar	1881	1·21	1·04	0·85	0·87	1·05	1·00	0·85	0·90	0·78	1·04	1·00	0·77	10·39
	1882	2·02	2·13	2·47	2·03	1·64	1·25	0·91	0·90	0·79	0·71	0·81	1·25	17·20
Shikárpur	1881	0·73	0·79	1·00	0·88	0·74	0·77	0·77	0·68	0·75	1·15	1·03	1·04	10·17
	1882	0·88	0·78	1·00	0·97	1·05	0·88	0·62	0·68	1·02	4·20	5·08	2·14	20·87
Upper Sind Frontier	1881	0·61	0·46	0·75	0·45	0·77	0·73	0·61	0·65	0·62	1·03	1·09	1·05	9·06
	1882	0·62	0·48	0·68	0·63	0·52	0·49	0·42	0·69	0·55	2·05	1·13	1·19	9·90
Total	1881	1·94	1·66	1·69	1·60	1·57	1·58	1·81	2·35	2·09	2·12	2·09	2·09	23·23
	1882	1·91	1·67	1·78	1·61	1·57	1·48	1·63	1·82	1·75	1·83	1·90	1·85	20·67

For the Sátára, Hyderabad, Thar and Párkar, Shikárpur and Upper Sind Frontier Districts the rate is higher than it was in 1881. In other districts it is lower, especially it is much lower in Ahmednagar, Surat, Broach, Kaira and Ahmedabad. The maximum (1·99) is in November, and the minimum (1·46) in June. In 1881 the maximum (2·55) was in August, and the minimum (1·57) in May.

Deaths by Districts from 1872 to 1882.

21. The deaths in each district from 1872 to 1880 are given in the following table, and the mean for that period is contrasted with the number of deaths for 1881 and 1882 :—

Division.	Number.	Registration Districts.	Population according to Census of 1881.	Deaths by Diseases.									For 9 years.		Deaths in 1881.	Ratio per 1,000 of Population on Census of 1881.	Deaths in 1882.	Ratio per 1,000 of Population on Census of 1881.
				1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	Total.	Mean annual Number of Deaths.	Mean Ratio per 1,000 of Population on Census of 1872.			
Northern Deccan.	1	Khándesh	1,237,231	23,338	14,361	14,852	31,051	20,511	25,885	36,454	18,392	21,077	205,941	22,882	22·25	30,661	24·78	27,304	22·07
	2	Nasik	781,206	21,241	12,553	12,169	18,809	17,147	24,466	26,920	14,448	14,334	162,168	18,019	24·53	21,502	27·60	19,349	24·77
	3	Ahmednagar	761,228	19,283	11,992	13,809	23,790	20,640	30,891	27,855	16,564	14,102	178,981	19,787	25·56	21,270	28·21	14,658	19·01
	4	Poona	900,021	27,031	17,151	14,339	21,927	19,841	30,819	29,097	12,593	14,094	187,392	20,820	22·95	19,757	21·94	16,071	17·84
	5	Sholápur	582,487	15,232	9,115	10,743	17,064	18,339	35,054	26,648	23,189	10,942	166,348	18,483	25·74	12,632	21·72	11,063	18·99
Southern Deccan.	6	Sátára	1,062,350	29,097	21,905	19,648	23,133	24,775	52,033	40,872	21,233	20,844	254,140	28,238	26·61	22,676	21·35	24,035	22·62
	7	Belgaum	864,014	20,168	15,721	19,677	30,064	21,021	70,244	44,208	26,674	23,498	281,275	31,253	33·29	20,132	23·30	20,015	23·17
	8	Dhárwár	882,907	25,841	21,304	21,845	30,538	31,726	83,857	42,365	24,558	21,284	303,318	33,710	34·12	20,492	23·20	19,938	22·58
	9	Kaládgi	638,493	19,652	10,596	13,429	16,149	20,628	83,053	24,209	19,190	14,195	221,101	24,567	30·10	13,517	21·17	12,193	19·10
Konkan.	10	Kánara	421,840	10,452	10,068	10,853	11,338	12,708	21,561	17,242	13,635	11,871	119,728	13,303	33·59	12,051	28·56	10,863	25·61
	11	Ratnágiri	997,090	12,123	14,806	12,840	14,445	15,585	21,289	18,663	27,736	17,220	154,809	17,201	16·88	15,603	15·63	14,637	14·68
	12	Kolába	381,643	5,103	4,310	5,787	5,430	4,499	6,254	6,665	6,391	6,427	48,888	5,432	15·50	7,723	20·23	7,377	19·07
	13	Bombay City ...	773,196	19,739	16,602	15,132	18,295	20,553	33,223	26,586	22,294	20,873	192,927	21,434	33·21	21,553	27·87	20,229	26·16
	14	Thána	908,548	19,500	17,831	14,425	21,030	16,457	23,611	20,962	17,497	17,131	168,504	18,723	22·09	20,170	22·20	20,071	22·09
Gujarat.	15	Surat	614,198	16,803	18,352	14,978	17,048	15,870	15,325	15,810	17,711	15,425	147,322	16,369	26·96	21,112	34·37	14,007	22·81
	16	Broach	326,930	7,067	8,396	7,165	9,052	7,569	7,751	15,208	13,370	10,326	87,384	9,709	27·71	12,209	37·34	11,454	29·35
	17	Kaira	804,800	18,183	20,341	16,201	20,380	18,151	15,396	30,890	29,213	23,570	192,325	21,369	27·30	25,964	32·26	17,970	22·33
	18	Panch Mahális ...	235,479	3,447	3,738	3,025	4,465	5,183	3,557	18,214	3,483	3,796	48,908	5,434	22·57	4,452	17·43	4,083	15·98
	19	Ahmedabad	856,324	20,948	21,597	19,382	21,235	22,358	17,069	34,305	31,243	24,539	212,616	23,624	28·48	25,797	30·12	20,724	24·20
Sind.	20	Karáchi	478,688	7,812	6,282	4,742	4,768	6,317	6,965	7,275	7,327	6,353	57,841	6,427	15·18	8,971	18·74	8,807	18·40
	21	Hyderabad	754,624	11,106	6,358	5,621	6,180	7,358	8,810	9,764	9,836	7,354	72,387	8,043	11·14	9,999	13·25	11,000	14·58
	22	Thar and Párkar ...	203,344	762	732	1,125	1,146	1,861	2,509	3,752	1,960	2,311	16,158	1,795	9·93	3,453	16·98	3,498	17·20
	23	Shikárpur	352,995	11,097	7,339	7,949	7,697	8,224	7,417	7,251	7,940	6,490	71,083	7,898	10·18	8,873	10·17	17,802	20·37
	24	Upper Sind Frontier.	124,181	725	602	925	711	939	729	726	865	625	6,847	761	8·45	813	6·36	1,230	9·90

ABSTRACT.

Northern Deccan	4,232,773	105,150	64,229	65,912	112,724	96,478	147,115	147,384	85,186	74,549	899,920	99,991	24·02	105,902	24·90	88,445	20·80
Southern Deccan	3,447,764	95,338	69,516	74,598	99,884	108,150	289,187	151,654	91,655	79,801	1,059,804	117,767	30·96	79,817	22·28	76,181	22·10
Konkan	3,482,323	69,999	63,197	57,037	70,558	69,802	105,038	90,218	87,553	73,534	684,836	76,093	23·34	77,100	22·14	73,017	20·97
Gujarát	2,837,731	67,048	72,626	60,751	72,660	69,131	59,038	114,427	95,229	77,356	688,555	76,506	27·22	89,718	31·39	63,438	22·20
Sind	2,413,823	31,502	21,313	20,358	19,892	24,699	26,430	29,068	27,928	23,133	224,318	24,024	11·37	31,913	13·22	42,337	17·54
The Presidency	16,454,414	367,057	290,972	278,652	375,718	368,260	627,708	532,951	387,542	328,673	3,557,533	395,281	24·25	381,450	23·18	343,418	20·87

N.B.—Owing to the imperfectness of the cause details of the deaths (31,087) in the Shikárpur District in 1872, the mean for the last 8 years has been taken for this district in letter-press.

It will be seen that in Sátára, Hyderabad, Thar and Párkar, Shikárpur and Upper Sind Frontier the recorded number of deaths for the year is higher than that for 1881, and in other districts it is lower. Taking the death-rate in each district for 1882, and comparing it with the mean death-rate for the period of 9 years ending with 1880, it will be seen that it is higher in Kolába—19·07 against 15·50, in Karáchi 18·40 against 15·18, Hyderabad 14·58 against 11·14, Thar and Párkar 17·20 against 9·93, Shikárpur 20·87 against 10·18, and in Upper Sind Frontier 9·90 against 8·45. In Shikárpur District the death-rate this year exceeds double the rate for 1881 and the mean for the preceding 9 years. In this year it was 20·87 against 10·17 in 1881. The mean rate for the previous 9 years was 10·18. The cause of this increased rate, as given by the Deputy Sanitary Commissioner Sind Registration District, is here given:—"The greatly increased number" "of deaths in the Shikárpur District from fever is due to the inundations, and as is" "usual the greatest number was registered in November." By divisions Sind only shows the higher death-rate in this year than in 1881—17·54 against 13·22. The other divisions show a comparative lower death-rate. It is much lower in Gujarát this year than in 1881—22·20 against 31·39. On comparing the death-rate of this year with the mean death-rate for 9 years ending with 1880 it will be seen that out of 5 divisions Sind only shows a higher death-rate—17·54 against 11·37.

Khándesh.

22. In Khándesh District the total number of deaths was 27,304, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000.
Cholera	135	·11	3,176	2·57	1,749	1·70
Small-pox	132	·11	6	...	1,240	1·21
Fevers	21,833	17·65	21,897	17·70	15,572	15·14
Bowel complaints	4,206	3·40	4,555	3·68	3,102	3·02
Injuries	277	·22	293	·24	332	·32
Other causes	721	·58	734	·59	887	·86
Total ...	27,304	22·07	30,661	24·78	22,882	22·25

The maximum monthly mortality (3,073) during the year was in August and the minimum (1,605) in June. In 1881 they were, respectively, 5,997 in August and 1,468 in February. From fevers the highest number (2,386) was in November, and the lowest (1,211) in June. For last year the extremes were 3,221 and 1,161, and they occurred in August and March.

Násik.

23. In Násik District the total number of deaths was 19,349, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000.
Cholera	301	·39	1,461	1·87	896	1·22
Small-pox	32	·04	4	·01	752	1·02
Fevers	15,137	19·38	16,327	20·90	12,514	17·04
Bowel complaints	1,831	2·34	1,791	2·29	1,537	2·09
Injuries	147	·19	160	·20	177	·24
Other causes...	1,901	2·43	1,819	2·33	2,143	2·92
Total ...	19,349	24·77	21,562	27·60	18,019	24·53

The maximum monthly mortality (2,024) during the year was in November and the minimum (1,220) in June. In 1881 they were, respectively, 2,698 in October and 1,208 in March. From fevers the highest number (1,637) was in November and the lowest (925) in June. In last year the extremes were 1,717 and 984, and they occurred in October and March.

Ahmednagar.

24. In Ahmednagar District the total number of deaths was 14,658, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000.
Cholera	182	·24	2,645	3·52	1,457	1·88
Small-pox	6	·01	...	...	564	·73
Fevers	10,712	14·26	13,567	18·05	12,949	16·73
Bowel complaints	1,368	1·82	1,709	2·28	2,059	2·66
Injuries	166	·22	165	·22	187	·24
Other causes	2,224	2·96	3,184	4·24	2,571	3·32
Total ...	14,658	19·51	21,270	28·31	19,787	25·56

The maximum monthly mortality (1,682) during the year was in August, and the minimum (830) in February. In 1881 they were respectively 4,187 and 931 in these months. From fevers the highest number (1,190) was in August, and the lowest (649) in February. In 1881 the extremes were 2,004 and 721, and they occurred also in these months.

Poona.

25. In Poona District the total number of deaths was 16,071, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882:—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000.
Cholera	211	·23	1,412	1·57	1,868	2·06
Small-pox	506	·56	...	...	556	·61
Fevers	11,420	12·68	13,967	15·51	13,459	14·84
Bowel complaints	1,345	1·49	1,463	1·62	1,632	1·80
Injuries	266	·29	330	·37	299	·33
Other causes	2,323	2·58	2,585	2·87	3,006	3·31
Total ...	16,071	17·84	19,757	21·94	20,820	22·95

The maximum monthly mortality (1,576) during the year was in August, and the minimum (1,111) in February. In 1881 they were, respectively, 2,786 in August and 1,176 in April. From fevers the highest number (1,088) was in August, and the lowest (828) in February. In last year the extremes were 1,668 and 910, and they occurred in August and March.

Sholápur.

26. In Sholápur District the total number of deaths was 11,063, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882:—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000.
Cholera	480	·82	1,307	2·24	1,299	1·81
Small-pox	4	·01	...	...	427	·60
Fevers	7,962	13·67	8,531	14·66	10,217	14·22
Bowel complaints	906	1·55	942	1·61	1,855	2·58
Injuries	152	·26	177	·30	228	·32
Other causes	1,559	2·68	1 695	2·91	4,457	6·21
Total ...	11,063	18·99	12,652	21·72	18,483	25·74

The maximum monthly mortality (1,513) during the year was in August and the minimum (593) in February. In 1881 they were, respectively, 2,264 in August and 668 in April. From fevers the highest number (879) was in August, and the lowest (469) in February. In the last year the extremes were 1,009 and 533, and they occurred in August and April.

Sátára.

27. In Sátára District the total number of deaths was 24,035, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000.
Cholera	2,406	2·26	866	·82	2,150	2·03
Small-pox	3	...	...	...	491	·46
Fevers	16,395	15·43	17,360	16·34	19,161	18·06
Bowel complaints	1,814	1·71	1,631	1·54	3,153	2·97
Injuries	357	·34	319	·30	407	·38
Other causes	3,060	2·88	2,500	2·35	2,876	2·71
Total ...	24,035	22·62	22,676	21·35	28,238	26·61

The maximum monthly mortality (2,695) during the year was in August and the minimum (1,388) in February. In 1881 they were, respectively, 2,933 in September and 1,423 in March. From fevers the highest number (1,720) was in August, and the lowest (1,097) in March. In last year the extremes were 1,840 and 1,183, and they occurred in September and March.

Belgaum.

28. In Belgaum District the total number of deaths was 20,015, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000.
Cholera	1,334	1·54	349	·40	2,493	2·66
Small-pox... ...	47	·05	4	...	743	·79
Fevers	9,932	11·50	11,874	13·75	14,943	15·92
Bowel complaints...	3,412	3·95	3,026	3·50	2,649	2·82
Injuries	337	·39	327	·38	368	·39
Other causes ...	4,953	5·73	4,552	5·27	10,057	10·71
Total ...	20,015	23·17	20,132	23·30	31,253	33·29

The maximum monthly mortality (2,562) during the year was in May, and the minimum (1,326) in January. In 1881 they were, respectively, 1,826 in September and 1,528 in March. From fevers the highest number (993) was in May, and the lowest (707) in October. In last year the extremes were 1,231 and 870, and they occurred in April and August.

Dhárwár.

29. In Dhárwár District the total number of deaths was 19,938, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000.
Cholera	130	·15	5	·01	2,221	2·25
Small-pox ...	13	·01	...	...	865	·87
Fevers	11,448	12·97	12,886	14·60	18,082	18·31
Bowel complaints...	3,511	3·98	3,167	3·57	5,126	5·19
Injuries	282	·32	302	·34	405	·41
Other causes ...	4,554	5·16	4,132	4·68	7,011	7·09
Total ...	19,938	22·58	20,492	23·20	33,710	34·12

The maximum monthly mortality (1,804) during the year was in July, and the minimum (1,476) in April. In 1881 they were, respectively, 2,154 in January and 1,437 in June. From fevers the highest number (1,139) was in March, and the lowest (813) in October. In last year the extremes were 1,499 and 856, and they occurred in January and August.

Kaládgi.

30. In Kaládgi District the total number of deaths was 12,193, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios in 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000.
Cholera	543	·85	138	·22	1,960	2·40
Small-pox... ...	7	·01	...	...	395	·48
Fevers	8,112	12·71	10,025	15·70	13,855	16·98
Bowel complaints...	1,011	1·58	1,284	2·01	1,495	1·83
Injuries	224	·35	249	·39	337	·41
Other causes ...	2,296	3·60	1,821	2·85	6,525	8·00
Total ...	12,193	19·10	13,517	21·17	24,567	30·10

The maximum monthly mortality (1,456) during the year was in August, and the minimum (731) in February. In 1881 they were, respectively, 1,358 in January and 932 in November. From fever the highest number (879) was in May, and the lowest (521) in February. In last year the extremes were 1,073 and 667, and they occurred in January and November.

Kánara.

31. In Kánara District the total number of deaths was 10,803, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000.
Cholera	...	...	2	...	428	1·07
Small-pox... ...	51	·12	1	...	289	·73
Fevers	6,269	14·86	7,244	17·17	7,444	18·68
Bowel complaints ..	751	1·78	808	1·92	1,214	3·05
Injuries	239	·57	225	·53	224	·56
Other causes ...	3,493	8·28	3,771	8·94	3,704	9·30
Total ...	10,803	25·61	12,051	28·56	13,303	33·39

The maximum monthly mortality (1,087) during the year was in February and the minimum (767) in September. In 1881 they were, respectively, 1,343 in January and 760 in May. From fevers the highest number (652) was in February, and the lowest (431) in September. In last year the extremes were 854 and 450, and they occurred in January and May.

Ratnágiri.

32. In Ratnágiri District the total number of deaths was 14,637, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios in 1882:—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000.
Cholera	99	·10	484	·49	547	·54
Small-pox... ...	8	·01	19	·02	457	·45
Fevers	8,353	8·38	8,869	8·89	9,491	9·31
Bowel complaints ..	852	·85	1,398	1·40	1,516	1·49
Injuries	391	·39	375	·38	407	·40
Other causes ...	4,934	4·95	4,458	4·47	4,783	4·69
Total ..	14,637	14·68	15,603	15·65	17,201	16·88

The maximum monthly mortality (1,560) during the year was in January, and the minimum (962) in June. In 1881 they were, respectively, 1,599 in August and 1,081 in June. From fevers the highest number (899) was in January, and the lowest (487) in June. In last year the extremes were 968 and 554, and they occurred in these months.

Kolába.

33. In Kolába District the total number of deaths was 7,277, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios in 1882:—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000
Cholera	149	·39	687	1·80	417	1·19
Small-pox... ...	90	·24	49	·13	154	·44
Fevers	5,458	14·30	5,545	14·53	3,598	10·27
Bowel complaints .	107	·28	88	·23	199	·57
Injuries	143	·38	142	·37	130	·37
Other causes ...	1,330	3·48	1,212	3·17	934	2·66
Total ...	7,277	19·07	7,723	20·23	5,432	15·50

The maximum monthly mortality (852) during the year was in January, and the minimum (461) in June. In 1881 they were, respectively, 1,001 in August and 461 in May. From fevers the highest number (630) was in January, and the lowest (328) in June. In last year the extremes were 674 and 353, and they occurred in December and May.

Bombay City.

34. In Bombay City the total number of deaths was 20,229, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios in 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000.
Cholera	190	·25	529	·68	615	·95
Small-pox ...	91	·12	37	·05	911	1·41
Fevers	5,421	7·01	6,411	8·29	7,610	11·81
Bowel complaints...	1,586	2·05	2,004	2·59	2,195	3·41
Injuries	336	·43	350	·45	298	·46
Other causes ...	12,605	16·30	12,222	15·81	9,805	15·22
Total ...	20,229	26·16	21,553	27·87	21,434	33·26

The maximum monthly mortality (2,131) during the year was in March, and the minimum (1,343) in June. In 1881 they were, respectively, 1,963 in August and 1,612 in February. From fevers the highest number (585) was in January, and the lowest (341) in June. In last year the extremes were 629 and 443, and they occurred in May and September.

Thána.

35. In Thána District the total number of deaths was 20,071, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000.
Cholera	774	·85	531	·58	1,440	1·70
Small-pox... ...	328	·36	16	·02	505	·60
Fevers	16,308	17·95	17,109	18·83	14,046	16·58
Bowel complaints...	276	·30	239	·26	388	·44
Injuries	438	·48	404	·44	428	·51
Other causes ...	1,947	2·14	1,871	2·06	1,916	2·26
Total ...	20,071	22·09	20,170	22·20	18,723	22·09

The maximum monthly mortality (2,238) during the year was in January, and the minimum (1,306) in October. In 1881 they were, respectively, 2,477 in December and 1,346 in May. From fevers the highest number (1,946) was in January, and the lowest (1,050) in June. In last year the extremes were 2,265 and 1,066, and they occurred in December and June.

Surat.

36. In Surat District the total number of deaths was 14,007, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per1,000.	Total Deaths.	Ratio per1,000.	Mean Number.	Ratio per1,000.
Cholera	9	·01	2,751	4·48	643	1·06
Small-pox... ...	89	·15	7	·01	427	·70
Fevers	10,686	17·40	14,661	23·87	11,408	18·79
Bowel complaints .	1,291	2·10	1,741	2·83	1,404	2·31
Injuries	243	·40	235	·38	270	·44
Other causes ...	1,689	2·75	1,717	2·80	2,217	3·65
Total ...	14,007	22·81	21,112	34·37	16,369	26·96

The maximum monthly mortality (1,504) during the year was in November and the minimum (934) in June. In 1881 they were, respectively, 2,610 in July and 1,358 in February. From fevers the highest number (1,206) was in November, and the lowest (662) in June. In last year the extremes were 1,567 and 995, and they occurred in August and May.

Broach.

37. In Broach District the total number of deaths was 6,654, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per1,000.	Total Deaths.	Ratio per1,000.	Mean Number.	Ratio per1,000.
Cholera	1	...	120	·37	327	·93
Small-pox... ...	...	...	2	·01	171	·49
Fevers	5,619	17·19	10,835	33·14	7,866	22·45
Bowel complaints .	498	1·52	674	2·06	487	1·39
Injuries	130	·40	118	·36	130	·37
Other causes ...	406	1·24	644	1·97	728	2·08
Total ...	6,654	20·35	12,393	37·91	9,709	27·71

The maximum monthly mortality (739) during the year was in January, and the minimum (404) in June. In 1881 they were, respectively, 1,193 in January and 765 in May. From fevers the highest number (652) was in January, and the lowest (333) in June. In last year the extremes were 1,098 and 636, and they occurred in these months.

Kaira.

38. In Kaira District the total number of deaths was 17,970, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per1,000.	Total Deaths.	Ratio per1,000.	Mean Number.	Ratio per1,000.
Cholera	268	·33	72	·09	598	·77
Small-pox ...	5	·01	1	...	383	·49
Fevers	14,614	18·15	22,317	27·73	16,917	21·61
Bowel complaints .	1,768	2·20	2,013	2·50	1,960	2·50
Injuries	301	·37	320	·40	318	·41
Other causes ...	1,014	1·26	1,241	1·54	1,193	1·52
Total ...	17,970	22·33	25,964	32·26	21,369	27·30

The maximum monthly mortality (1,707) during the year was in November, and the minimum (1,147) in June. In 1881 they were, respectively, 3,165 in October and 1,635 in May. From fevers the highest number (1,428) was in March, and the lowest (908) in June. In last year the extremes were 2,757 and 1,417, and they occurred in October and May.

Panch Mahâls.

39. In Panch Mahâls District the total number of deaths was 4,083, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000	Total Deaths.	Ratio per 1,000	Mean Number.	Ratio per 1,000.
Cholera	...	...	...	...	633	2·63
Small-pox ...	4	·02	2	·01	49	·20
Fevers	3,818	14·94	4,152	16·25	3,947	16·39
Bowel complaints .	100	·39	104	·41	347	1·44
Injuries	83	·32	94	·37	120	·50
Other causes ...	78	·31	100	·39	338	1·40
Total ...	4,083	15·98	4,452	17·43	5,434	22·57

The maximum monthly mortality (655) during the year was in November, and the minimum (180) in June. In 1881 they were, respectively, 452 and 286, and reported in these months. From fevers the highest number (646) was in November, and the lowest (144) in June. In last year the extremes were 429 and 262, and they occurred in these months.

Ahmedabad.

40. In Ahmedabad District the total number of deaths was 20,724, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population are here contrasted with the deaths and ratios for 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000
Cholera	689	·80	159	·18	811	·98
Small-pox	23	·03	...	...	297	·36
Fevers	16,171	18·88	21,251	24·82	17,146	20·67
Bowel complaints .	1,136	1·33	1,216	1·42	1,315	1·58
Injuries	241	·28	188	·22	262	·32
Other causes ...	2,464	2·88	2,983	3·48	3,793	4·57
Total ...	20,724	24·20	25,797	30·12	23,624	28·48

The maximum monthly mortality (2,249) during the year was in January and the minimum (1,304) in July. In 1881 they were, respectively, 3,118 in November and 1,339 in June. From fevers the highest number (1,841) was in January and the lowest (917) in July. In last year the extremes were 2,740 and 1,088, and they occurred in November and June.

Karáchi.

41. In Karáchi District the total number of deaths was 8,807, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882 :—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000	Total Deaths.	Ratio per 1,000	Mean Number.	Ratio per 1,000
Cholera	...	...	...	...	135	·32
Small-pox... ...	63	·13	102	·21	63	·15
Fevers	6,898	14·41	7,112	14·86	4,933	11·65
Bowel complaints .	267	·56	171	·35	94	·22
Injuries	263	·55	290	·61	276	·65
Other causes ...	1,316	2·75	1,296	2·71	926	2·19
Total ...	8,807	18·40	8,971	18·74	6,427	15·18

The maximum monthly mortality (1,104) during the year was in March and the minimum (487) in July. In 1881 they were, respectively, 1,153 in December and 446 in August. From fevers the highest number (941) was in March and the lowest (299) in July. In last year the extremes were 1,014 and 288, and they occurred in December and August.

Hyderabad.

42. In Hyderabad District the total number of deaths was 11,000, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882:—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000	Total Deaths.	Ratio per 1,000	Mean Number	Ratio per 1,000
Cholera	...	...	...	...	159	·21
Small-pox ...	99	·13	55	·07	90	·13
Fevers	9,894	13·11	8,937	11·84	6,582	9·12
Bowel complaints .	79	·10	71	·09	77	·11
Injuries	411	·54	458	·61	498	·69
Other causes ...	517	·69	478	·63	637	·88
Total ...	11,000	14·58	9,999	13·25	8,043	11·14

The maximum monthly mortality (1,700) during the year was in March and the minimum (413) in July. In 1881 they were, respectively, 1,508 in December and 459 in July. From fevers the highest number (1,619) was in March, and the lowest (282) in July. In last year the extremes were 1,447 and 333, and they occurred in December and July.

Thar and Párkar.

43. In Thar and Párkar District the total number of deaths was 3,498, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882:—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000.	Total Deaths.	Ratio per 1,000.	Mean Number.	Ratio per 1,000.
Cholera	3	·01	...	...	21	·12
Small-pox... ...	1	...	4	·02	11	·06
Fevers	3,111	15·30	3,242	15·94	1,566	8·66
Bowel complaints .	8	·04	7	·03	41	·23
Injuries	105	·52	67	·33	77	·43
Other causes ...	270	1·33	135	·66	79	·43
Total ...	3,498	17·20	3,455	16·98	1,795	9·93

The maximum monthly mortality (502) during the year was in March and the minimum (145) in October. In 1881 they were, respectively, 500 in December and 143 in September. From fevers the highest number (462) was in March and the lowest (119) in October. In last year the extremes were 483 and 122, and they occurred in December and September.

Shikárpur.

44. In Shikárpur District the total number of deaths was 17,802, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 8 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882:—

	1882.		1881.		Mean for 8 Years.	
	Total Deaths.	Ratio per 1,000	Total Deaths.	Ratio per 1,000	Mean Number.	Ratio per 1,000
Cholera	...	...	...	...	170	·22
Small-pox	29	·03	202	·24	133	·17
Fevers	16,772	19·66	7,617	8·93	6,366	8·20
Bowel complaints ...	200	·23	195	·23	202	·26
Injuries	335	·39	342	·40	299	·39
Other causes ...	466	·55	317	·37	329	·43
Total ...	17,802	20·87	8,673	10·17	7,499	9·67

The maximum monthly mortality (4,334) during the year was in November and the minimum (534) in July. In 1881 they were, respectively, 1,190 in November and 531 in August. From fevers the highest number (4,242) was in November, and the lowest (426) in July. In last year the extremes were 1,134 and 420, and they occurred in November and August.

Upper Sind Frontier.

45. In Upper Sind Frontier District the total number of deaths was 1,230, and they were reported from the following causes. The deaths in 1881 and the mean for the preceding 9 years ending with 1880, together with their ratios per 1,000 of population, are here contrasted with the deaths and ratios for 1882:—

	1882.		1881.		Mean for 9 Years.	
	Total Deaths.	Ratio per 1,000	Total Deaths.	Ratio per 1,000	Mean Number.	Ratio per 1,000
Cholera	...	...	...	...	11	·12
Small-pox	...	...	28	·23	17	·19
Fevers	1,110	8·94	667	5·37	614	6·82
Bowel complaints ...	30	·24	45	·36	26	·29
Injuries	46	·37	20	·16	38	·42
Other causes ...	44	·35	55	·44	55	·61
Total ...	1,230	9·90	815	6·56	761	8·45

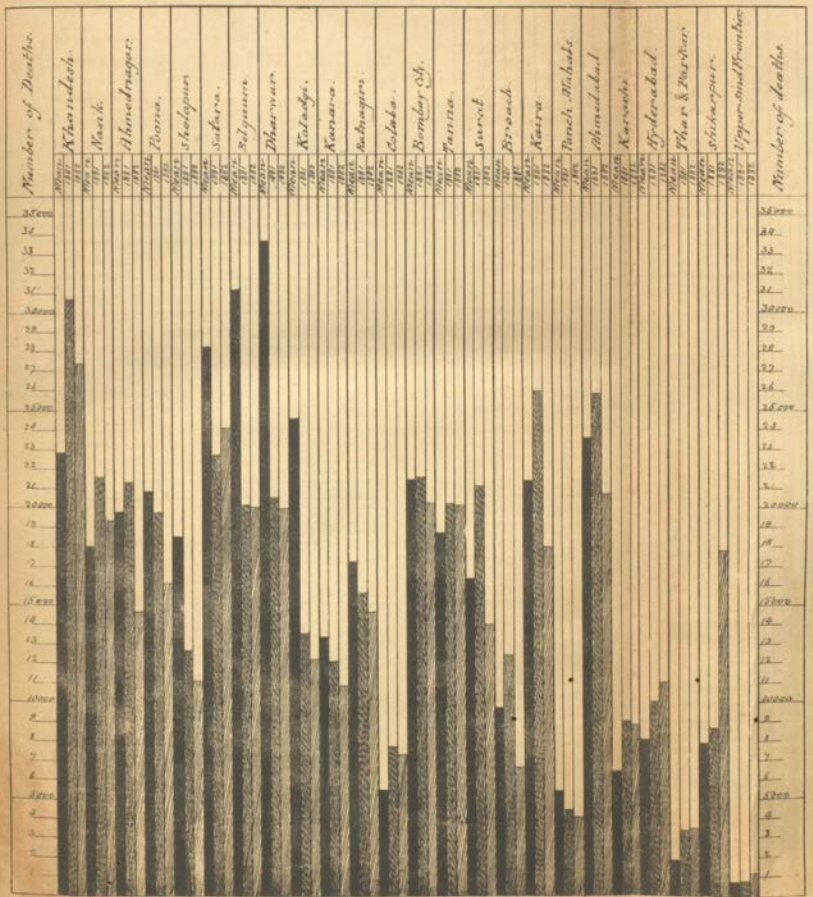
The maximum monthly mortality (259) during the year was in October and the minimum (52) in July. In 1881 they were, respectively, 98 in November and 41 in April. From fevers the highest number (246) was in October, and the lowest (40) in July. In last year the extremes were 88 and 33, and they occurred in November and February.

Diagram showing the number of deaths registered in each district.

46. The diagram on the opposite page will show the number of deaths registered in each district for 1882 contrasted with the number for 1881 and the mean for the preceding 9 years ending with 1880.

Diagram

showing for each District the total number of deaths registered in 1881 compared with the total for 1881 and the mean for the preceding 9 years ending with 1880.



47. The comparative results of deaths at different stages of life are given in the following table, and it will be seen that in 1882 the ratio of infants under 1 year is higher than that for 1881—165·92 against 164·69: at other stages it is lower. Taking the mean mortality for the past 7 years ending with 1880 there is remarkable increase of ratio of infant mortality in each of the two succeeding years. The mean ratio for 7 years was 108·80 against 164·69 in 1881 and 165·92 in 1882. In other stages there is a considerable decline in the ratio this year as well in 1881 than the mean for the preceding 7 years. The percentage on total deaths among infants is 22·11 against 19·76 in 1881, among children above 1 and under 12 years and adults above 12 and under 50 years of age is 57·77 against 59·57, and amongst old people 20·12 against 20·67 in 1881. The percentage on total mean deaths for 7 years ending with 1880 was 14·82 amongst infants, 60·28 amongst children and adults, and 24·90 amongst old people:—

Deaths at different stages of life.

Statement of Ages.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	Mean for 7 years.	Ratio per 1,000 of Population by Census of 1872.	Percentage on total mean Deaths for 7 years.	1881.	Ratio per 1,000 of Population by Census of 1881.	Percentage on total Deaths.	1882.	Ratio per 1,000 of Population by Census of 1881.	Percentage on total Deaths.
Infants (unable to walk) (under 1 year) ...	60,945	68,606	68,596	98,787	56,265	44,559	55,003	61,394	109·50	14·82	75,371	164·69	19·76	75,931	165·92	22·11
Boys and girls, 1 to 12 years ...	70,965	102,743	93,404	132,200	126,150	94,821	71,409	101,821	19·15	24·58	88,704					
Adults (men and women) 12 to 50 years ...	67,413	122,241	121,256	222,209	208,084	157,079	126,406	147,554	16·20	35·70	125,400	*15·94	{ 23·57 / 20·20 }	*198,406	*12·93	*57·77
Old people (men and women) over 50 years	90,329	81,606	84,964	156,272	132,222	101,281	76,876	103,136	62·81	24·90	78,855	43·23	20·67	69,081	20·64	20·12
Total ...	289,652	375,118	368,220	607,768	522,821	397,842	329,672	414,196	25·20	100	381,450	29·18	100	343,418	20·97	100

N.B.—In 1878 there were 130 deaths from January to June in Mirpur Khás E. C. in the Hyderabad District, of which no information as to deaths by ages was available.

* The census tables do not give the age divisions from 1 to 12, and from 12 to 50: for this reason the ratios for these periods for 1881 and the numbers and ratio for 1882 cannot be given on the enumerated population; they must be shown for the single period.

48. The number of deaths at the different age periods for each district and the ratio per 1,000 upon the living numbers for the same periods enumerated at the census of 1881, are shown in the following table, and it will be seen that for the Presidency the mortality amongst infants under 1 year was 165·92 per 1,000 against 164·69 in 1881. It ranged this year from a maximum of 252·69 in the city of Bombay to a minimum 79·53 in the Hyderabad District. The period of greatest immunity was that "above 10 and under 15", when the rate was 6·09 per 1,000. In 1881 it was "above 20 and under 30", when the rate was 14·14 per 1,000. For those above 60 years of age and upwards the mortality was at the rate of 52·15 against 57·97 per 1,000 in 1881. The percentage on total deaths amongst infants under 1 year is at the rate of 22·11 for the Presidency against 19·76 in 1881, but for the Shikárpur District it is 31·55. In 1881 the percentage on total deaths amongst infants for this district was at the rate of 23·34. For those "above 1 and under 5" the percentage on total deaths is at the rate of 16·72 for the Presidency, but in the Khándesh District it is 24·46, in Násik 23·28, and in Shikárpur 22·35. In other districts the percentage is below 20. For old people "above 60 and upwards" the percentage on total deaths for the Presidency is at the rate of 11·28 against 11·29 in 1881, but in the Sátára District it is 14·17, in Belgaum 12·41, in Ratnágiri 19·61, in Kolába 12·44, in Surat 13·81, in Kaira 12·94, in Karáchi 13·23, and in Thar and Párkar 12·89. In other districts the percentage is below 12.

Deaths at different age periods.

Formerly.	Under 1 Year.		1 and under 5 Years.		5 and under 10 Years.		10 and under 15 Years.		15 and under 20 Years.		20 and under 30 Years.		30 and under 40 Years.		40 and under 50 Years.		50 and under 60 Years.		60 and upwards.		Total.	
	Number of Deaths.	Rate per 1,000 of Births.	Number of Deaths.	Rate per 1,000 of Births.	Number of Deaths.	Rate per 1,000 of Births.	Number of Deaths.	Rate per 1,000 of Births.	Number of Deaths.	Rate per 1,000 of Births.	Number of Deaths.	Rate per 1,000 of Births.	Number of Deaths.	Rate per 1,000 of Births.	Number of Deaths.	Rate per 1,000 of Births.	Number of Deaths.	Rate per 1,000 of Births.	Number of Deaths.	Rate per 1,000 of Births.	Number of Deaths.	Rate per 1,000 of Births.
Khiradah	7,714	157·00	2,476	63·02	1,371	34·90	1,371	34·90	777	19·78	1,804	45·93	1,326	33·76	1,375	35·01	1,077	27·42	1,015	25·84	19,906	506·86
Mach...	4,439	153·07	1,450	50·00	1,205	41·56	1,205	41·56	699	24·11	1,644	56·70	1,209	41·70	1,254	43·25	1,027	35·42	1,015	35·00	14,928	514·77
Akmednagar	4,005	159·99	1,244	49·69	726	29·00	726	29·00	454	18·13	1,231	49·17	1,010	40·34	1,048	41·86	1,010	40·34	1,015	40·54	12,469	498·04
Poona	3,466	157·00	1,097	49·70	639	28·95	639	28·95	399	18·07	1,081	48·97	889	40·28	923	41·82	889	40·28	894	40·51	10,976	497·33
Sholapur	2,218	160·87	702	50·91	409	29·66	409	29·66	256	18·56	692	50·18	569	41·27	591	42·86	569	41·27	572	41·48	6,897	500·16
Sátára	4,771	157·00	1,510	49·70	881	29·00	881	29·00	550	18·10	1,490	49·04	1,225	40·32	1,272	41·87	1,225	40·32	1,232	40·55	15,137	498·20
Belgaum	4,006	157·00	1,268	49·70	739	28·96	739	28·96	461	18·07	1,250	48·99	1,028	40·28	1,067	41·82	1,028	40·28	1,034	40·51	12,700	497·66
Dhárwár	4,812	157·00	1,523	49·70	888	28·98	888	28·98	554	18·08	1,501	48·98	1,234	40·27	1,281	41·81	1,234	40·27	1,241	40·50	15,366	501·36
Khándesh	5,303	157·00	1,678	49·70	978	28·96	978	28·96	610	18·06	1,653	48·95	1,359	40·25	1,411	41·79	1,359	40·25	1,367	40·49	16,926	501·27
Khándesh	5,303	159·00	1,678	50·31	978	29·32	978	29·32	610	18·29	1,653	49·56	1,359	40·74	1,411	42·31	1,359	40·74	1,367	40·98	16,926	507·45
Khándesh	5,303	159·00	1,678	50·31	978	29·32	978	29·32	610	18·29	1,653	49·56	1,359	40·74	1,411	42·31	1,359	40·74	1,367	40·98	16,926	507·45
Ratnágiri	1,240	159·00	392	50·26	229	29·36	229	29·36	143	18·33	386	49·49	318	40·77	330	42·31	318	40·77	320	41·03	3,925	503·26
Kolába	1,161	159·00	367	50·26	215	29·45	215	29·45	134	18·35	362	49·59	298	40·82	309	42·33	298	40·82	300	41·09	3,679	503·81
Bombay City	8,470	159·00	2,678	50·28	1,569	29·46	1,569	29·46	977	18·34	2,640	49·57	2,176	40·85	2,262	42·47	2,176	40·85	2,191	41·13	26,708	501·41
Thána	3,476	157·00	1,099	49·64	643	29·04	643	29·04	401	18·11	1,084	48·96	892	40·29	927	41·87	892	40·29	898	40·56	10,955	494·80
Surat	3,476	157·00	1,099	49·64	643	29·04	643	29·04	401	18·11	1,084	48·96	892	40·29	927	41·87	892	40·29	898	40·56	10,955	494·80
Broach	1,240	159·00	392	50·26	229	29·36	229	29·36	143	18·33	386	49·49	318	40·77	330	42·31	318	40·77	320	41·03	3,925	503·26
Kaira	3,564	159·00	1,012	50·26	591	29·36	591	29·36	368	18·33	996	49·49	820	40·77	851	42·31	820	40·77	825	41·03	10,117	503·26
Panch Mahálá	2,497	159·00	709	50·26	414	29·36	414	29·36	258	18·33	698	49·49	574	40·71	596	42·26	574	40·71	578	40·99	7,087	502·56
Ahmedabad	2,760	157·00	784	49·77	458	29·06	458	29·06	285	18·09	771	48·92	635	40·30	659	41·83	635	40·30	639	40·56	7,904	501·66
Panch Mahálá	2,760	159·00	784	50·26	458	29·36	458	29·36	285	18·33	771	49·49	635	40·77	659	42·31	635	40·77	639	41·03	7,904	507·26
Ahmedabad	2,760	159·00	784	50·26	458	29·36	458	29·36	285	18·33	771	49·49	635	40·77	659	42·31	635	40·77	639	41·03	7,904	507·26
Kaira	3,564	159·00	1,012	50·26	591	29·36	591	29·36	368	18·33	996	49·49	820	40·77	851	42·31	820	40·77	825	41·03	10,117	503·26
Broach	1,240	159·00	392	50·26	229	29·36	229	29·36	143	18·33	386	49·49	318	40·77	330	42·31	318	40·77	320	41·03	3,925	503·26
Surat	3,476	157·00	1,099	49·64	643	29·04	643	29·04	401	18·11	1,084	48·96	892	40·29	927	41·87	892	40·29	898	40·56	10,955	494·80
Thána	3,476	157·00	1,099	49·64	643	29·04	643	29·04	401	18·11	1,084	48·96	892	40·29	927	41·87	892	40·29	898	40·56	10,955	494·80
Bombay City	8,470	159·00	2,678	50·28	1,569	29·46	1,569	29·46	977	18·34	2,640	49·57	2,176	40·85	2,262	42·47	2,176	40·85	2,191	41·13	26,708	501·41
Kolába	1,161	159·00	367	50·26	215	29·45	215	29·45	134	18·35	362	49·59	298	40·82	309	42·33	298	40·82	300	41·09	3,679	503·81
Ratnágiri	1,240	159·00	392	50·26	229	29·36	229	29·36	143	18·33	386	49·49	318	40·77	330	42·31	318	40·77	320	41·03	3,925	503·26
Khándesh	5,303	159·00	1,678	50·31	978	29·32	978	29·32	610	18·29	1,653	49·56	1,359	40·74	1,411	42·31	1,359	40·74	1,367	40·98	16,926	507·45
Khándesh	5,303	157·00	1,678	49·70	978	28·96	978	28·96	610	18·06	1,653	48·95	1,359	40·25	1,411	41·79	1,359	40·25	1,367	40·49	16,926	501·27
Khiradah	7,714	157·00	2,476	63·02	1,371	34·90	1,371	34·90	777	19·78	1,804	45·93	1,326	33·76	1,375	35·01	1,077	27·42	1,015	25·84	19,906	506·86
Mach...	4,439	153·07	1,450	50·00	1,205	41·56	1,205	41·56	699	24·11	1,644	56·70	1,209	41·70	1,254	43·25	1,027	35·42	1,015	35·00	14,928	514·77
Akmednagar	4,005	159·99	1,244	49·69	726	29·00	726	29·00	454	18·13	1,231	49·17	1,010	40·34	1,048	41·86	1,010	40·34	1,015	40·54	12,469	498·04
Poona	3,466	157·00	1,097	49·70	639	28·95	639	28·95	399	18·07	1,081	48·97	889	40·28	923	41·82	889	40·28	894	40·51	10,976	497·33
Sholapur	2,218	160·87	702	50·91	409	29·66	409	29·66	256	18·56	692	50·18	569	41·27	591	42·86	569	41·27	572	41·48	6,897	500·16
Sátára	4,771	157·00	1,510	49·70	881	29·00	881	29·00	550	18·10	1,490	49·04	1,225	40·32	1,272	41·87	1,225	40·32	1,232	40·55	15,137	498·20
Belgaum	4,006	157·00	1,268	49·70	739	28·96	739	28·96	461	18·07	1,250	48·99	1,028	40·28	1,067	41·82	1,028	40·28	1,034	40·51	12,700	497·66
Dhárwár	4,812	157·00	1,523	49·70	888	28·98	888	28·98	554	18·08	1,501	48·98	1,234	40·27	1,281	41·81	1,234	40·27	1,241	40·50	15,366	501·36

Deaths by Caste or Class.

49. The deaths by caste or class in each district are given in the Annual Form No. V in the Appendix, and it will be seen that by the census of 1881 the Mahomedans numbered 3,106,482, and amongst them there were 55,549 deaths in this year against 51,811 in 1881. The death-rates per 1,000 of Mahomedan population for those years were, respectively, 17·88 and 16·68. The Hindu population amounted to 13,128,729 persons, and amongst them 282,171 deaths during the year were reported. In 1881 the total was 323,786. The death-rate per 1,000 of Hindu population is 21·49 against 24·66 in 1881. There are 138,326 Christians numbered at the late census and amongst them 2,530 deaths were recorded during the year against 2,168 in 1881. The respective rates per 1,000 of Christian population was 18·29 against 12·06 in 1881. The head of All other Castes or Classes include the population not falling in any of the three specified caste divisions. By the census, of 1881 they are numbered 80,877, and amongst them there were 3,168 deaths against 3,685 in 1881. The death-rates per 1,000 for those years were, respectively, 39·17 and 48·03. For Mahomedans the maximum rate (29·87) during the year was in the Bombay City, and the minimum (8·39) in the Upper Sind Frontier. In 1881 the extremes were 37·12 and 5·19, and they were respectively reported from Broach and Upper Sind Frontier Districts. Amongst Hindus the maximum (33·37) was in the Thar and Párkar District, and the minimum (14·58) in Ratnágiri. In last year they occurred in Broach (38·00) and Ratnágiri (15·43). The maximum death-rate in this year amongst Christians is 206·40, and was reported from Sholápur District, and the minimum 2·71 from Shikárpur.

Deaths by Causes.

50. The subjoined table shows deaths from the specified causes for each year from 1872 to 1882. The mean for 9 years ending with 1880 is contrasted with the total deaths from six different causes for 1881 and 1882. These diseases will be dealt with in Section II :—

Years.	Deaths by Causes.						
	Cholera.	Small-pox.	Fevers.	Bowel Complaints.	Injuries.	All other Causes.	All Causes.
1872	15,642	26,699	206,747	23,694	5,804	67,404	355,960
1873	283	9,935	188,201	26,259	5,951	60,343	290,972
1874	37	3,903	183,717	26,990	6,165	57,840	278,652
1875	47,555	3,461	219,156	33,650	6,217	65,679	375,718
1876	32,117	11,817	220,833	33,683	5,928	63,882	368,260
1877	57,252	27,369	336,865	60,257	7,539	138,426	627,708
1878	46,743	4,475	357,376	41,165	7,550	75,642	532,951
1879	6,937	1,156	286,526	26,349	7,107	59,467	387,542
1880	684	940	246,779	24,452	6,052	49,796	328,673
Total ...	207,250	89,755	2,246,200	306,469	58,343	638,419	3,546,436
Mean for 9 years	23,028	9,973	249,578	34,052	6,482	70,935	394,048
Ratio per 1,000 of population enumerated at the census of 1872...	1·42	0·61	15·38	2·10	0·40	4·37	24·28
1881	16,694	539	272·403	30,342	5,950	55,522	381·450
Ratio per 1,000 of population enumerated at the census of 1881...	1·01	0·03	16·56	1·84	0·36	3·38	[23·18
1882	7,904	1,630	243,454	28,353	5,913	56,164	343,418
Ratio per 1,000 of population enumerated at the census of 1881...	0·48	0·10	14·80	1·72	0·36	3·41	20·87

N.B.—In the Shikárpur District the total of deaths in 1872 was 11,097; the cause details were so imperfect that they are not included in the total for that year.

Deaths by Months.

51. The deaths by months from 1872 to 1882 are shown in the following table, and it will be seen that in 1842 the greatest number (32,877) occurred in November, and the least (24,000) in June. In 1881 the greatest number (41,997) was in August, and the least (26,004) in June. The mean for 9 years ending with 1880 shows that the maximum (39,408) was in August and the minimum (26,933) in February :—

Years.	Total Deaths by Months from all Causes.												
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1872	27,847	27,290	30,020	29,726	27,645	30,162	33,723	39,264	33,594	29,076	32,811	26,827	367,987
1873	28,891	27,699	28,921	31,968	29,977	29,592	32,503	34,772	34,028	29,629	30,953	30,149	360,973
1874	28,643	29,909	27,743	29,870	31,015	31,405	29,744	34,410	32,240	29,386	30,623	29,904	356,293
1875	28,909	29,071	29,870	28,490	31,879	30,902	43,574	40,902	33,956	31,025	31,660	29,455	375,719
1876	29,126	29,881	30,222	29,879	30,989	29,159	32,8367	35,415	31,284	29,401	31,485	29,170	369,990
1877	37,106	33,375	45,779	47,896	50,453	51,090	61,231	70,182	67,411	59,256	55,097	46,510	627,706
1878	41,702	31,828	34,069	30,674	43,967	45,752	49,412	56,911	52,964	48,905	46,706	40,450	523,954
1879	34,942	29,109	30,935	32,942	36,029	37,385	41,432	39,512	35,392	37,013	40,261	32,889	387,842
1880	32,399	29,501	30,907	36,191	34,944	32,690	36,117	37,515	35,813	34,967	33,606	29,491	393,672
Total ..	291,077	242,304	269,619	267,746	297,372	294,146	323,397	354,675	326,012	311,769	319,611	290,004	3,527,932
Mean for 9 years ..	31,231	26,933	29,845	29,694	31,370	31,572	35,932	39,408	36,224	34,640	35,535	32,223	392,214
Ratio per 1,000 of population enumerated at the census of 1872	1·92	1·66	1·84	1·83	1·92	1·95	2·21	2·43	2·23	2·13	2·19	2·03	24·25
1881	31,893	27,304	27,955	27,025	29,902	26,004	31,393	41,997	37,051	34,305	34,359	34,391	365,450
Ratio per 1,000 of population enumerated at the census of 1881	1·94	1·66	1·69	1·65	1·57	1·58	1·91	2·55	2·29	2·12	2·09	2·09	22·18
1882	29,719	27,405	29,343	26,706	28,514	24,000	30,650	39,961	29,554	29,623	32,877	30,426	342,419
Ratio per 1,000 of population enumerated at the census of 1881	1·81	1·67	1·78	1·61	1·72	1·46	1·82	1·82	1·75	1·81	1·99	1·85	20·79

Diagram showing Deaths by Months.

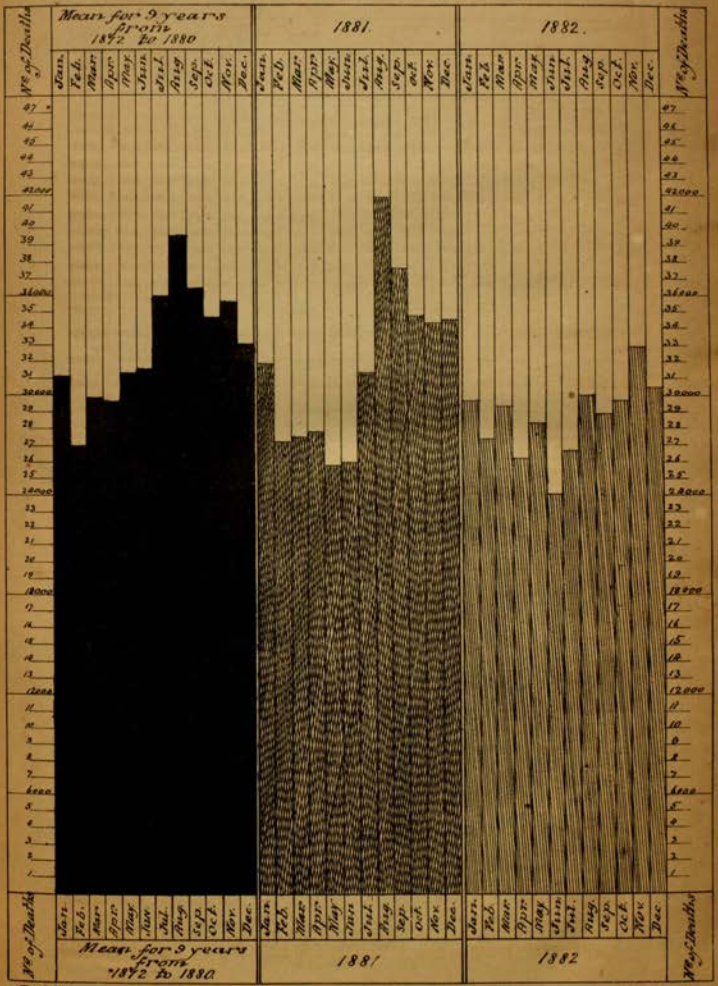
52. The diagram on the opposite page will show the number of deaths in each month in 1882 contrasted with the total for 1881, and the mean number in each month for the preceding 9 years ending with 1880.

Deaths by Circles.

53. The statistical returns are received from 223 rural and 55 town circles; from 8 cantonments in British and 9 in foreign territories. Up to the year 1881 the cantonments of Poona and Kirkee were shown as one cantonment circle, as the population enumerated at the census of 1872 was not shown separately. In the census of 1881 the population of both these cantonments was separately given: so the births and deaths for each of them for the year under report are recorded accordingly. The aggregate population, by the census of 1881, of the rural circles is 14,351,769, of the town circles 2,041,321, and of the cantonments in British territory 61,324. It will be seen by the subjoined table that the highest recorded

Diagram

showing the total number of deaths registered in each month in 1882 contrasted with the number in each month in 1881 and the mean for each month for the preceding 9 years ending with 1880.


Mean for 9 years from 1872 to 1880
1881.
1882.
Nos. of Deaths
Jan. Feb. Mar. Apr. May. Jun. Jul. Aug. Sep. Oct. Nov. Dec.
Mean for 9 years from 1872 to 1880
1881
1882

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Photozincographed Genl. Office, Feb. 1883

death-rate per 1,000 of population is, as in last year, amongst the urban population:—

Districts.	Number of Registration Circles.				Population by Census of 1881.				Ratio of Deaths per 1,000 of Population.			
	Rural Circles.	Towns.	Cantonments.	Total.	Rural Circles.	Towns.	Cantonments.	Total.	Rural Circles.	Towns.	Cantonments.	Total.
Khándesh	22	4	..	26	1,187,002	49,329	....	1,237,231	22·26	17·37	..	22·07
Násik	12	2	2	16	734,880	41,451	4,866	781,206	24·04	36·74	32·88	24·77
Ahmednagar	11	2	1	14	704,940	41,594	4,694	751,228	18·73	23·15	16·61	19·51
Poona	8	2	2	12	753,245	100,995	37,381	900,621	17·40	21·33	16·64	17·84
Sholápur	7	3	..	10	489,818	92,669	....	582,487	16·94	29·64	..	18·99
Sátára	12	3	..	15	1,010,888	51,482	....	1,062,550	22·04	22·34	..	22·63
Belgaum	7	3	1	11	809,624	44,608	9,582	864,014	22·26	23·65	12·73	22·17
Dhárwár	14	4	..	18	791,856	91,071	....	882,907	22·31	24·98	..	22·58
Kaládgi	8	1	*1	10	631,469	7,024	*Not shown separately, but included in towns.	638,493	19·06	22·21	..	19·10
Kánara	11	3	..	13	397,450	24,390	....	421,840	25·85	27·73	..	25·61
Ratnágiri	8	2	..	10	975,527	21,563	....	997,000	14·48	23·51	..	14·68
Kolába	6	2	..	8	368,469	13,180	....	381,649	19·02	20·48	..	19·07
Bombay City	..	1	..	1	....	73,196	....	773,196	..	20·16	..	20·16
Thána	11	3	..	14	379,831	727,717	....	806,548	22·36	15·99	..	22·09
Surat	8	2	..	10	481,125	25,073	....	614,198	22·73	22·11	..	22·81
Broach	6	2	..	8	278,170	148,760	....	326,930	20·98	16·80	..	20·83
Kaira	7	4	..	11	727,186	67,614	....	804,800	21·96	26·52	..	22·38
Panch Mahále	5	2	..	7	229,743	25,736	....	255,479	15·95	16·28	..	15·93
Ahmedabad	7	4	1	12	645,434	66,089	4,601	856,324	20·67	20·08	13·95	24·20
Karáchi	12	1	..	14	410,356	168,322	....	478,688	17·21	25·51	..	18·49
Hyderabad	12	1	..	14	700,429	45,195	....	754,624	13·67	28·84	..	14·54
Thar and Párkar ..	7	1	..	8	290,516	2,828	....	293,344	16·74	50·21	..	17·20
Shikárpur	17	3	..	20	769,913	83,073	....	852,986	20·38	25·20	..	20·87
Upper Sind Frontier ..	3	1	..	4	112,829	11,352	....	124,181	9·23	15·59	..	9·96
Total ..	222	55	5	286	14,351,769	2,047,321	61,224	16,454,414	99·13	20·20	17·11	20·8

Statistics for Cantonment Bázárs in *quasi*-foreign territory.

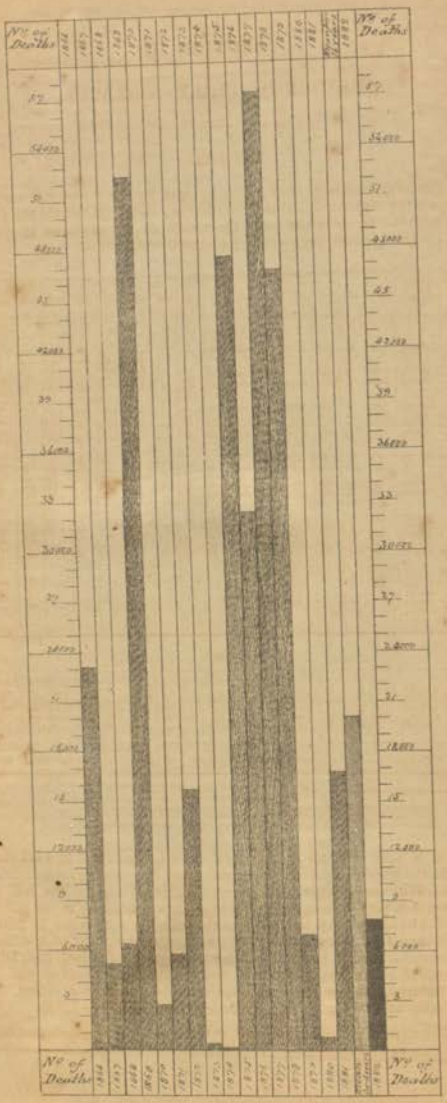
54. The following table shows the births and deaths and their respective ratios per 1,000 of population for those in our cantonment bázárs in *quasi*-foreign territory. It will be seen that in 1882 the births registered were 2,103 against 2,281 in 1881: there were 1,136 male births and 967 female; the birth-rate per 1,000 of population being 21·93 against 25·66 in 1881. In 4 out of 9 cantonments the birth-rate for this year is higher than it was in last year. The lower birth-rates are—at Aden 6·13 against 9·02 in 1881, Mehidpur 70·80 against 96·77, Neemuch 11·09 against 16·80, Nasirabad 51·87 against 58·30, and Rájkot *nil* against 21·23. It is very noticeable that not a single birth has been registered during the year 1882 at Rájkot Cantonment, although it has a population of 4,965 souls. In 1881 there were 30 births registered. The total of deaths was 2,727, and their rate was 28·43 per 1,000. In 1881 the total was 3,641, or 42·07 per 1,000. From cholera there were 56 deaths against 181 in 1881, and they were reported

2 from Mhow, 51 from Neemuch, 1 from Nasirabad, and 2 from Rájkot. From small-pox there were 16 deaths against 9 in last year, but 11 of them were reported from Nasirabad and 4 from Aden; the remaining 1 occurred at Neemuch. The deaths from fevers were 1,240 against 1,427 in 1881, and from bowel complaints 273 against 604.

Cantonments.	Civil Population according to Census of 1881.	Area in square miles.	Average Population per square mile.	Number of Deaths.							Ratio per 1,000 of Population.							Births.	Ratio of Births per 1,000 of Population.
				Cholera.	Small-pox.	Fevers.	Bowel Complaints.	Injuries.	All other Causes.	Total.	Cholera.	Small-pox.	Fevers.	Bowel Complaints.	Injuries.	All other Causes.	Total.		
Aden	31,280	11	2,845·27	..	4	386	105	14	419	389	..	0·13	12·33	3·27	0·45	13·39	31·57	192	6·13
Baroda	2,412	1	2,412	..	..	27	1	..	11	39	..	..	11·19	0·41	..	4·56	16·16	23	9·53
Bhuj	303	1·04	244·23	..	..	3	1	..	3	7	..	..	8·28	3·79	..	8·28	19·55	8	22·25
Deesa	6,376	3	1,075·22	..	..	54	18	..	59	131	..	..	6·45	2·15	..	7·04	15·64	120	14·23
Mehidpur ..	113	2	56·50	..	..	2	..	..	3	5	..	..	17·70	..	..	26·55	44·25	8	70·80
Mhow	17,471	6·90	2,687·86	2	..	417	11	2	207	654	0·11	..	23·87	1·66	0·46	11·85	37·45	555	30·62
Neemuch ..	11,787	4·23	2,786·52	51	1	88	2	..	119	262	4·33	0·09	8·31	0·17	..	9·23	22·23	225	11·09
Nasirabad ..	19,123	8·00	2,390·37	1	11	233	65	14	295	659	0·05	0·57	12·23	3·40	0·73	15·42	33·41	902	51·87
Rájkot	4,365	Unknown.		2	..	..	..	..	..	2	0·43	..	..	..	..	..	0·43	..	..
Total ..	95,903	38·77	2473·64	58	16	1,240	273	35	1,107	2,727	0·58	0·17	12·93	2·85	0·36	11·54	28·43	2,105	21·93

N.B.—The population for Nasirabad, according to the census of 1881, has not yet been received, and therefore, the number has been taken as enumerated at the census of 1872.

Diagram
Showing for the Bombay Presidency Cholera Mortality for 17 years.



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SECTION II.

HISTORY OF CHIEF DISEASES.

CHOLERA.

1. The subjoined table shows, year by year, for the period indicated and for each district the registered deaths from cholera; and the totals for the year 1882 are so placed as to contrast with the means of the previous 16 years. A diagram on the opposite page shows the annual variation :—

Divisions	Number	Registration Districts on Collectorates.	Population by Census of 1881.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	Total for 16 years.	Means for 16 years.	1882
Northern Deccan.	1	Khándesh	1,207,321	61	37	559	2,672	19	1,039	1,577	..	..	6,224	29	1,694	6,627	136	..	3,176	23,844	1,472	139
	2	Násik	781,206	..	..	..	930	53	1,451	1,903	..	..	2,818	338	1,068	971	124	55	1,461	11,802	746	307
	3	Ahmednagar	731,328	809	88	1,302	437	61	668	1,327	..	..	4,328	1,115	2,760	2,467	186	11	2,645	19,616	1,226	232
	4	Poona	900,621	161	9	696	1,706	214	263	2,613	..	2	4,646	719	2,672	3,691	160	461	1,413	21,246	1,328	211
	5	Sholápur	567,432	1,841	46	779	2,606	271	260	1,462	..	..	3,150	2,255	1,354	2,074	22	2	1,207	18,599	1,162	81
Southern Deccan.	6	Sátára	1,062,350	1,154	23	617	5,157	562	121	1,540	..	..	2,666	1,338	6,702	5,198	..	14	566	29,859	1,867	2,438
	7	Belgaum	664,014	1,962	4	563	7,936	307	40	617	16	..	2,736	4,959	3,257	3,757	..	..	249	33,201	2,079	1,324
	8	Dhárwár	592,967	11,162	6	2	2,661	1	..	24	17	..	2,280	7,092	2,779	1,196	..	..	5	27,867	1,742	159
	9	Kaládgi	626,402	2,806	47	230	5,186	62	167	1,790	90	1	1,262	5,072	7,158	3,846	..	4	126	37,307	2,332	247
Konkan.	10	Kánara	421,940	838	74	66	833	4	..	..	..	..	47	229	2,864	74	..	..	5	5,130	321	..
	11	Ratnágiri	997,060	217	124	139	238	185	603	91	13	..	906	206	3,125	529	58	..	484	6,877	430	99
	12	Kolába	351,649	..	..	..	111	102	125	116	..	..	1,453	58	1,124	787	160	27	687	4,779	299	149
	13	Bombay City ..	773,196	252	111	227	734	208	324	191	96	19	834	874	2,016	1,153	223	39	1,095	8,171	511	190
	14	Thána	909,548	66	18	469	1,816	181	279	253	..	..	3,969	630	2,357	1,609	770	79	551	16,421	1,026	774
Gujarát.	15	Surat	614,198	102	10	151	2,090	20	72	454	11	4	963	1,172	972	1,776	269	4	2,721	10,948	684	9
	16	Broach	326,309	..	..	10	1,156	6	1	..	..	..	1,020	745	303	1,057	8	..	1,371	5,767	360	1
	17	Kaira	934,800	176	161	87	2,104	63	20	16	1	1	2,104	1,315	300	1,584	739	..	73	8,906	564	259
	18	Panch Maháls ..	216,479	20	14	15	1,534	6	2	20	..	..	1,090	263	176	4,130	..	4	..	7,274	455	..
	19	Ahmedabad	596,236	340	21	39	3,514	37	29	14	23	10	1,078	2,916	285	2,760	374	1	109	10,956	685	669
Sind.	20	Karáchi	478,488	3	357	23	3,744	..	..	..	..	..	* 42	..	..	..	1,175	..	..	5,549	347	..
	21	Hyderabad	754,824	1	132	..	1,779	..	..	..	..	..	..	..	..	..	1,402	..	..	3,314	209	..
	22	Thar and Párkar ..	202,344	..	..	..	737	..	..	..	..	..	6	89	..	20	14	..	..	86	5	3
	23	Shikárpur	352,946	..	3,467	..	1,253	..	..	..	..	..	..	..	..	..	1,355	..	..	6,075	380	..
	24	Upper Sind Frontier ..	124,194	..	101	..	..	..	..	..	..	..	..	..	..	..	99	..	..	200	12	..

ABSTRACT.

1	Northern Deccan ..	4,292,779	7,872	189	3,820	9,179	719	2,571	10,393	..	2	22,151	4,431	11,444	18,890	579	530	10,001	95,151	5,947	1,359
2	Southern Deccan ..	3,447,764	16,154	99	1,342	23,787	854	338	4,031	125	1	10,050	19,056	20,977	15,163	19	1	1,338	135,432	7,589	4,413
3	Konkan	3,452,793	1,474	327	931	3,430	936	1,457	711	107	19	9,209	2,372	12,500	4,094	1,289	127	2,323	41,782	2,098	1,232
4	Gujarát	2,787,731	499	196	241	9,496	133	55	317	52	15	6,209	6,374	1,846	11,378	920	9	3,195	40,765	2,548	967
5	Sind	1,412,796	9	4,350	23	7,513	..	..	..	..	..	48	89	..	20	4,143	..	..	16,197	1,012	3
	Total ..	16,454,413	26,007	5,143	6,347	52,359	2,656	5,021	15,442	285	37	47,655	32,317	57,322	49,743	6,947	684	16,054	319,278	19,955	7,904

N.B.—Prior to 1869 Násik was the portion of Khándesh and Ahmednagar Districts.
Do. Kolába do. of Thána District.
Deaths from 1866 to 1870 for Bombay City were taken from the Health Officer's Report.
Prior to 1868 Broach was the portion of the Surat District.
Deaths from 1866 to 1869 in Ahmedabad District were recorded only for one táluka (Dáskroi).

It will be seen that for the 16 years' period, from 1866 to 1881 inclusive, 319,278 deaths were registered from cholera, and this would give an annual rate of 19,955. With an equable rate, and with the grand total of the last census, out of every 823 persons living *one* died of cholera. Looking at the last line of the table it will be seen that for 10 years the triennial recurrence is unbroken: in the 11th and 12th years the famine was a disturbing factor, and the high number for the 13th year marks it as a recurrent year. The total then falls from 46,743 to 6,987, and in the next year to 684: in the next, however—the 16th—the wave returns and the deaths are 16,694. The year recurrent is not a recurrent year, and the number of deaths falls from 16,694 to 7,904.

2. The next table gives the death ratios per 1,000 of population for 1882 and for the previous 16 years :—

Division.	Number.	Registration Districts or Collectorates.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	Mean for 16 years.	1882.
Northern Deccan.	1	Khándesh	0·07	0·04	0·54	2·33	0·02	1·40	1·03	..	..	0·05	0·03	1·04	5·91	0·13	..	2·07	1·41	0·11
	2	Násik	..	..	..	1·01	0·09	2·16	2·81	..	..	2·83	0·44	2·37	1·27	0·19	0·08	1·87	1·06	0·22
	3	Ahmednagar	0·46	0·07	1·75	1·02	0·09	0·39	0·77	..	..	0·27	1·78	2·37	2·93	0·24	0·21	2·52	0·86	0·24
	4	Poona	0·24	0·21	1·10	2·35	0·29	0·31	4·25	..	..	2·12	0·76	4·04	3·07	0·11	0·21	1·57	1·54	0·23
	5	Sholápur	2·90	0·07	1·41	4·51	0·07	4·89	2·56	..	..	4·07	2·99	1·95	4·28	0·03	..	2·24	2·68	0·52
Southern Deccan.	6	Sátára	1·35	0·04	0·68	3·20	0·59	0·13	1·58	..	..	3·48	1·78	6·32	5·08	..	0·01	0·82	1·99	1·36
	7	Belgaum	2·17	0·01	0·47	2·97	0·37	0·93	0·96	..	..	2·91	0·97	3·89	6·13	..	..	0·49	2·35	1·74
	8	Dhárwár	14·32	0·01	..	3·17	..	0·01	..	..	..	2·32	0·20	2·89	1·91	..	..	0·01	2·24	2·15
	9	Kaládgi	0·02	0·08	0·40	7·21	0·09	0·23	2·51	0·11	..	1·67	3·07	5·73	2·72	..	0·09	0·22	2·01	0·19
Gujarát.	10	Kánara	2·38	0·20	0·18	1·47	0·01	..	..	..	..	0·15	2·24	7·04	0·19	..	..	..	1·24	..
	11	Ratnágirí	0·32	0·15	0·23	0·32	0·37	1·09	0·09	..	..	0·56	0·19	2·06	0·55	0·05	..	0·40	0·48	0·23
	12	Kolába	..	..	..	0·41	0·37	0·29	0·38	..	..	4·15	0·19	3·13	2·25	0·61	0·08	1·90	0·96	0·29
	13	Bombay City ..	0·41	0·14	0·25	0·22	0·47	0·26	0·20	0·14	0·02	1·29	0·56	2·80	1·41	0·50	0·02	0·66	0·74	0·23
	14	Thána	0·07	0·01	0·04	1·06	0·23	0·09	0·27	..	..	7·42	0·79	2·04	2·15	0·61	0·09	0·56	1·23	0·26
Konkan.	15	Surat	0·19	0·01	0·25	4·26	0·04	0·02	0·25	0·02	..	1·29	1·79	1·61	2·84	0·32	0·01	4·48	1·15	0·21
	16	Broach	..	..	0·05	0·41	0·04	..	..	..	..	2·46	2·04	0·80	2·93	0·05	..	0·27	0·69	0·09
	17	Kaira	0·20	2·27	0·13	3·24	0·10	0·03	0·02	0·02	..	2·08	1·61	0·26	2·08	0·16	..	0·09	0·98	0·23
	18	Panch Maháls ..	0·12	0·03	0·03	0·60	0·03	0·01	0·13	..	..	4·22	1·05	0·73	12·15	..	0·02	..	2·06	..
	19	Ahmedabad	0·17	0·01	0·04	3·02	0·08	0·05	0·02	0·03	0·01	1·20	2·20	0·34	2·26	0·22	..	0·29	0·79	0·28
Sind.	20	Karáchi	0·02	1·04	0·07	11·01	..	..	..	..	..	0·10	..	..	..	2·77	..	..	0·18	..
	21	Hyderabad	..	0·21	..	7·13	..	..	..	..	..	..	..	..	..	1·90	..	..	0·23	..
	22	Thar and Párkar ..	..	..	..	3·13	..	..	..	..	..	0·68	0·46	..	0·14	0·41	..	..	0·27	0·01
	23	Shikárpur	..	5·39	..	2·23	..	..	..	..	..	..	..	..	..	1·73	..	..	0·56	..
	24	Upper Sind Frontier	..	2·96	..	..	..	..	..	..	..	..	..	..	..	1·10	..	..	0·32	..

ABSTRACT.

1	Northern Division ..	0·69	0·04	0·92	1·97	0·17	0·95	2·49	..	..	0·25	1·40	2·75	2·92	0·14	0·13	2·35	1·47	0·21
2	Southern do. ..	4·78	0·02	0·35	0·25	0·29	0·06	1·06	0·05	..	2·84	0·81	2·14	2·99	0·60	0·00	0·29	2·06	1·35
3	Konkan	0·43	0·15	0·23	1·06	0·26	0·15	0·23	0·03	0·00	2·52	0·74	2·96	1·09	0·48	0·04	0·64	0·69	0·22
4	Gujarát	0·17	0·07	0·09	2·37	0·05	0·09	0·13	0·01	0·00	2·17	2·23	0·99	4·09	0·25	0·00	1·98	0·91	0·24
5	Sind	..	1·99	0·01	3·43	..	..	..	..	..	0·02	0·04	..	0·01	1·39	..	..	0·46	0·96
	Total ..	1·25	0·32	0·50	2·77	0·20	0·41	1·02	0·02	0·01	2·05	1·01	2·54	2·69	0·42	0·04	1·01	1·21	0·40

N.B.—Prior to 1869 Sátára was the portion of Khándesh and Ahmednagar Districts.
Do. Kolába do. Thána District.
Deaths from 1866 to 1870 for Bombay City were taken from the Health Officer's Report.
Prior to 1868 Broach was the portion of the Surat District.
Deaths from 1866 to 1868 in Ahmedabad District were recorded only for one táluka (Dholka).

It will be seen that in all the Southern Deccan districts excluding Sátára, in Sholápur of the Northern Deccan, and in one district of Gujarát (Panch Maháls) the mean ratios are between 2 and 3 per 1,000, whilst for the Presidency it is 1·31.

3. For 1882 the total of cholera deaths is 7,904 and for 1881 it was 16,694. The ratios per 1,000 living are, respectively, 0·48 and 1·01, whilst the mean for 16 years is 1·31. Out of every 1,000 deaths from all causes there were 23 from cholera.

Cholera Deaths in 1882.

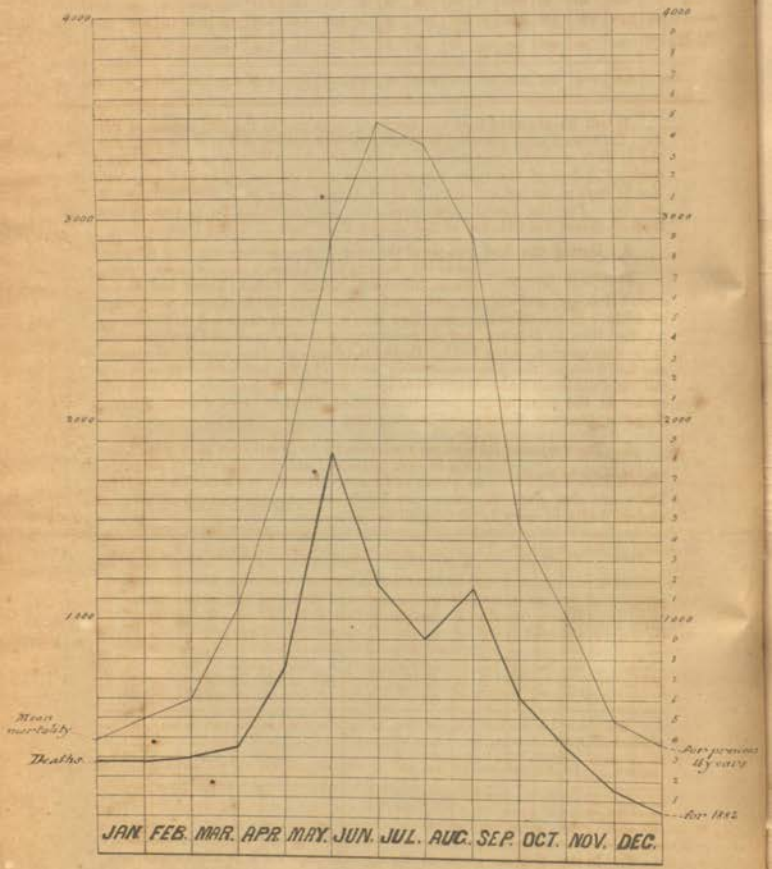
4. Showing the mortality by the two conventional seasons into which the year has been divided, it will be found that 3,846 out of 7,904 deaths occurred in the rainy season of 122 days:—

Mortality by Seasons.

Years.	Cold Season (121 Days).				Hot and Dry (61 Days).		Rainy Season (122 Days).				Hot and Damp (61 Days).		Total Deaths from Cholera.
	December (31).	January (31).	February (29).	March (31).	April (30).	May (31).	June (30).	July (31).	August (31).	September (30).	October (31).	November (30).	
1866	83	169	1,024	2,485	2,706	4,197	2,560	2,098	2,600	2,042	748	139	21,057
1867	201	56	74	33	86	64	97	216	2,507	1,266	314	97	5,143
1868	153	61	61	69	1,124	1,014	1,017	615	971	1,007	1,826	1,048	8,647
1869	272	1,079	999	1,670	6,460	5,191	9,566	3,813	4,443	2,402	2,734	1,317	52,397
1870	185	62	55	36	51	56	67	41	156	263	186	66	2,956
1871	111	251	237	175	137	401	804	1,005	1,014	555	899	174	5,833
1872	71	61	82	113	237	1,098	2,157	2,892	2,991	2,145	611	174	15,642
1873	2	61	100	36	34	31	10	6	3	1	2	1	287
1874	..	2	..	4	6	13	1	2	2	..	3	2	37
1875	819	1	1	10	795	3,509	10,924	12,909	8,979	3,698	1,647	1,649	47,555
1876	2,967	809	1,452	2,519	5,775	5,313	4,100	4,429	3,371	1,421	858	393	32,117
1877	797	2,734	4,488	6,987	9,114	5,299	8,320	7,673	5,143	1,874	1,110	814	57,052
1878	96	725	651	1,866	5,411	2,979	10,901	7,991	5,208	1,866	434	264	46,743
1879	173	78	19	21	64	1,176	2,664	1,066	210	401	541	183	6,027
1880	93	418	310	15	16	44	20	2	3	10	2	2	934
1881	200	79	47	23	30	244	1,409	2,613	6,568	3,327	1,403	550	16,694
Means for 16 years ..	329	467	504	1,043	1,810	2,466	3,479	3,279	2,926	1,471	1,024	492	29,956
1882	41	272	397	501	254	1,958	1,370	908	1,156	623	302	146	7,904

Diagram.

Showing for the Bombay Presidency, the monthly mortality from Cholera for 1882, and the mean mortality for the previous 16 years.



—— Mean mortality for 16 years

——— " for 1882.

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ABSTRACT.

Seasons.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	Mean for 16 years.	1882.
Cold (121 days) ..	2,734	398	626	2,902	570	943	227	199	6	831	7,958	15,806	2,025	290	632	415	2,492	961
Hot and dry (61 days)	6,813	150	121	16,227	61	728	1,835	58	21	6,154	9,085	16,413	16,379	1,240	22	364	4,700	2,589
Rainy (122 days) ..	11,584	4,206	2,642	27,260	851	5,378	13,195	22	8	26,382	13,383	23,019	26,651	4,882	22	14,012	11,248	3,846
Hot and damp (61 days) ..	870	401	2,938	4,851	1,484	772	785	5	2	3,188	1,691	1,923	699	724	5	1,960	1,515	508
Total ..	22,027	5,143	6,347	51,230	2,966	7,821	15,042	283	37	47,555	32,117	57,252	46,743	6,937	684	16,694	19,955	7,904

It will be observed from the foregoing table that in the cold season of 121 days the annual total mortality from cholera was 961—a rate of 8 per day. For the 61 days of the hot and dry season there were 2,589 deaths, or 42·5 per day; during 122 days of the rainy season there were 3,846 deaths, or 31·5 per day. For 61 days of the hot and damp or moist season there were 508 deaths—8·3 per day. For the Presidency generally the daily mortality for all seasons and from all causes was 941, and of this number there were 23 deaths from cholera.

Mortality by Quarters.

5. During the first quarter of the year the disease was confined more or less to the districts of Khándesh, Ahmednagar, Poona, Sátára, Ratnágiri, Kolába, Thána, Surat and to the city of Bombay; and out of 1,348 attacks there were 920 deaths—a percentage of 68·25. In the second quarter there were 8,152 fresh cases and 3,759 deaths reported from 13 districts; but the percentage of deaths to attacks was less than in the first quarter, being 46·11. In the third quarter there were 5,927 attacks and 2,676 deaths, the percentage being 45·15. In the last quarter there was a fall, and the attacks and deaths were 1,249 and 549 respectively, or 43·96 per cent. At the close of the year the affected districts were Poona, Sátára, Belgaum, Dhárwár, Kaládgi and Bombay City.

Mortality by Months.

6. The subjoined table shows the mortality by months for each year from 1866 to 1882 inclusive, and the means of 16 years are so placed as to contrast with the totals for the 17th. There are also given the ratios per 1,000 of population and the number of cholera deaths in every 1,000 from all causes:—

Months.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	Mean for 16 years.	1882.
January	160	96	64	1,039	62	331	61	61	2	1	990	2,724	725	78	413	79	467	272
February	1,020	76	66	900	20	767	62	100	..	1	1,450	1,488	630	18	110	67	584	297
March	2,466	55	60	1,676	20	174	115	35	4	16	3,519	6,567	1,566	21	15	26	1,043	322
April	2,790	86	61	6,406	25	137	237	24	8	790	3,778	6,114	6,413	64	18	70	2,134	334
May	4,107	64	70	9,761	58	591	1,096	24	13	3,159	3,312	3,799	9,904	1,176	4	344	2,990	1,303
June	5,003	87	78	9,666	67	804	2,127	19	1	10,874	4,198	9,230	10,869	2,604	2	1,461	3,878	1,179
July	2,036	216	403	9,816	41	1,005	3,973	6	3	13,989	4,426	7,673	7,991	1,093	2	3,618	3,279	909
August	3,600	2,507	871	4,449	158	1,014	3,991	3	1	8,800	3,871	5,143	5,979	539	2	6,566	3,692	1,146
September ..	2,049	1,986	1,597	3,439	265	550	2,145	6	3	3,466	1,422	1,974	1,852	405	10	2,756	1,471	612
October	748	214	1,890	2,704	886	189	611	3	2	2,548	836	1,116	424	541	3	1,410	1,024	362
November ..	126	87	1,048	1,117	599	174	97	..	..	1,060	530	813	274	165	1	500	491	146
December ..	62	201	452	274	453	181	71	2	..	519	2,097	797	98	173	32	209	370	41
Total ..	22,027	5,143	6,347	52,230	2,606	5,921	15,042	283	37	47,555	32,117	57,252	46,743	6,937	684	16,694	19,955	7,904
Ratio per 1,000 of population ..	1·85	0·22	0·50	3·77	0·20	0·41	1·03	0·02	0·01	2·92	1·96	3·54	2·89	0·43	0·04	1·01	1·21	0·49
Out of every 1,000 deaths from all causes there died from cholera ..	124	22	83	184	12	21	44	1	..	126	97	91	88	18	2	44	60	23

7. In the diagram given on the opposite page there is shown the mean cholera mortality by months from 1866 to 1881 inclusive, and the numbers for the year under report.

8. The following table shows, for the Bombay Presidency, the monthly ratios of cholera mortality per 1,000 of population from 1866 to 1881 inclusive, and the means of the period are contrasted with those for 1882:—

Months.	1866.	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	Mean for 16 years.	1882.
January	0·01	0·00	0·01	0·07	0·01	0·05	0·00	0·00	0·00	0·00	0·06	0·23	0·04	0·00	0·03	0·00	0·03	0·02
February	0·06	0·01	0·00	0·07	0·00	0·02	0·01	0·01	..	0·02	0·02	0·25	0·04	0·00	0·00	0·00	0·04	0·02
March	0·00	0·00	0·00	0·12	0·05	0·02	0·01	0·00	0·00	0·00	0·02	0·43	0·10	0·00	0·00	0·00	0·07	0·02
April	0·22	0·01	0·00	0·47	0·00	0·01	0·03	0·00	0·00	0·05	0·23	0·50	0·39	0·00	0·00	0·00	0·13	0·04
May	0·32	0·05	0·01	0·70	0·00	0·04	0·07	0·00	0·00	0·23	0·32	0·51	0·61	0·17	0·00	0·02	0·19	0·11
June	0·13	0·01	0·01	0·69	0·01	0·16	0·21	0·00	0·00	0·14	0·26	0·31	0·67	0·17	0·00	0·00	0·13	0·07
July	0·16	0·02	0·03	0·71	0·00	0·07	0·28	0·00	0·00	0·12	0·27	0·48	0·49	0·07	0·00	0·16	0·23	0·06
August	0·20	0·13	0·07	0·52	0·01	0·07	0·26	0·00	0·00	0·05	0·21	0·32	0·37	0·03	0·00	0·20	0·13	0·07
September	0·16	0·10	0·10	0·23	0·02	0·04	0·14	0·00	0·00	0·01	0·09	0·21	0·12	0·03	0·00	0·21	0·10	0·04
October	0·06	0·02	0·15	0·27	0·05	0·04	0·04	0·00	0·00	0·02	0·02	0·07	0·03	0·00	0·00	0·07	0·07	0·02
November	0·01	0·01	0·02	0·08	0·07	0·01	0·01	0·00	..	0·01	0·04	0·05	0·02	0·01	0·00	0·02	0·02	0·01
December	0·01	0·02	0·04	0·02	0·03	0·01	0·00	0·00	..	0·05	0·15	0·05	..	0·01	0·00	0·02	0·03	0·00
Mean for the Presidency	1·33	0·22	0·50	3·77	0·20	0·41	1·05	0·02	0·01	2·30	1·98	3·54	3·89	0·43	0·04	1·01	1·21	0·43

9. The next table shows the enumerated population according to the census of 1881 of each district affected, the deaths by months in each, and for the Presidency generally, the ratio per 1,000 living, and mean ratios during the 16 years. It will be observed, that for the year the ratios in 16 out of 18 affected districts are below the mean, and above it for the rest. The mean of the 16-year period is 1·31 :—

Population by Census of 1881.	16,454,414.	1,321,221.	701,505.	771,228.	990,811.	220,497.	1,462,105.	864,014.	805,937.	639,426.	907,200.	305,630.	773,196.	899,246.	414,158.	700,398.	800,500.	456,178.	905,344.
Months.	Presidency.	Ekhtesham.	Nasik.	Ahmednagar.	Poona.	Sholapur.	Satara.	Belgaum.	Dharwar.	Kaladgi.	Bijapur.	Kolaba.	Bombay City.	Thana.	Surat.	Broach.	Kaira.	Ahmedabad.	Thar and Par kar.
January	272	17	..	7	..	..	11	..	..	..	32	24	30	69	3	..	..	..	..
February	227	..	..	..	..	..	..	..	..	..	29	20	32	156	..	..	..	..	..
March	351	..	..	..	6	..	..	..	..	..	35	..	17	311	..	..	..	..	..
April	734	..	..	..	16	..	624	241	..	..	7	..	5	60	1	..	..	..	..
May	1,055	..	..	..	24	4	757	803	7	39	9	..	1	..	..	..	..	102	1
June	1,170	..	..	16	80	39	816	151	3	163	6	..	..	..	24	5	..	444	..
July	906	..	..	35	15	161	332	93	..	113	..	..	12	79	5	..	6	98	..
August	1,158	80	98	60	43	253	253	30	..	124	..	3	12	50	..	..	139	9	..
September	611	13	148	31	43	54	187	7	6	31	..	..	3	9	..	1	32	..	..
October	362	20	58	22	37	19	90	1	..	8	..	13	3	..	..	..	17	..	..
November	146	..	4	6	5	..	19	16	88	13	..	..	..	1	..	..	3	..	..
December	41	..	..	..	12	..	..	1	26	1	..	..	..	..	..	..	..	..	..
Total ..	7,004	130	201	183	283	430	2,408	1,354	130	542	99	140	190	719	9	1	198	653	1
Ratio of Deaths per 1,000 of Population	0·43	0·11	0·28	0·24	0·23	0·92	2·28	1·54	0·16	0·85	0·10	0·33	0·25	0·83	0·01	0·00	0·23	0·86	0·05
Mean ratio for 16 years.	1·31	1·41	1·06	1·96	1·54	2·08	1·79	2·52	2·24	2·21	0·48	0·86	0·74	1·23	1·15	0·99	0·68	0·79	0·6

10. Before tracing the course of the disease, month by month, it will be as well to recall to recollection what was the condition at the close of 1881. For December of that year the disease lingered in 6 districts, and the number of attacks and deaths was 448 and 266 respectively, but on the last day of the month it was present at 4 different points in 4 districts, *viz.*, Pimpalner Táluka of the Khándesh District, Haveli Táluka of the Poona District, Bijápur Táluka of the Kaládgi District, and in the city of Bombay.

11. On the 1st of January, cholera was present in 2 villages, and subsequently it appeared in a third village in the Pimpalner Táluka of the Khándesh District, the attacks and deaths for the district during the month being 30 and 17 respectively. On the 15th, it broke out in Garkhindi, a village in the Párner Táluka of the Ahmednagar Collectorate, and between this date and 28th there were 15 attacks and 7 deaths. On the 10th it also appeared in the Karád Táluka of the Sátára Collectorate, where there were 20 seizures and 11 deaths: with these the disease subsided in all districts of the Deccan, but in the Konkan District it travalled along the sea-coast. In the city of Bombay it continued from the preceding year, and there were 96 cases with 80 deaths. In the Ratnágiri District it appeared on the 1st in one of the villages of the Málvan Táluka, and within a fortnight it spread to two other talukas (Chiplún and Dápoli), causing 45 attacks and 32 deaths. In the Kolába District there were, in the town of Mahád, 2 fresh cases on the 1st: both ended in recovery, but the disease lingered in 5 villages of this táluka from the first to the last of the month. On the 19th, it appeared in one of the villages of the Pen Táluka in the same district, and 10 days afterwards it broke out in the town of

January.

Pen. On the 28th the disease made its appearance in Kamarle, a village in the Alíbág Táluka—the record for the whole district being 99 attacks and 54 deaths. In the town of Thána it appeared on the 7th, and by the 9th and 29th it reached Kúrla and Bhándup, two villages on the G. I. P. Railway line, in the Sálsette Táluka. One of the villages of the Panvel Táluka in the Thána District was attacked on the 10th, and subsequently the disease spread to 6 other villages in the same táluka, the satistics for the district being 127 cases and 69 deaths. On the 28th, 2 fatal cases were reported from a village in the Jalálpor Táluka of the Surat Collectorate. Thus cholera was present in 8 collectorates during the month. The attacks and deaths for the month were, respectively, 434 and 272,—the percentage of the latter to the former being 62·67, whilst their percentage to the total deaths from all causes was 0·92. The average number of deaths from cholera for the previous 16 Januaries was 487. The ratio per mille of population during the month was 0·02, whilst the mean ratio for the 16 corresponding months was 0·03.

February.

12. The disease disappeared during this month from all the districts of the Deccan, but it continued somewhat severely in the Konkan districts, especially in those situated along the sea-coast. On the 3rd, it appeared in one of the villages in the Rájápur Táluka, and within 12 days spread to 8 other neighbouring villages in the same táluka. On the 5th it visited the town of Ratnágiri, the monthly total for the district being 82 attacks and 29 deaths. In the Kolába District the disease continued from the 1st; but it lasted here for only 13 days, during which time 104 persons were attacked, of whom 80 died. In Bombay City it prevailed during the whole month, and 66 fresh cases and 52 deaths were recorded. In the Thána District it continued throughout the month in the tálukas previously affected, and in Kalyán and Karjat tálukas there were fresh outbreaks, the record for the month being 204 seizures and 136 deaths. Thus during the month, cholera was present in 4 districts only. The attacks and deaths for the month were 456 and 297 respectively,—the percentage of the latter to the former being 65·13, whilst their percentage to the total deaths from all causes was 1·09. The average number of deaths from cholera in the corresponding month of the 16 preceding years was 584. The ratio per mille of population during the month was 0·02; whilst the mean ratio for the 16 corresponding months was 0·04

March.

13. On the 17th March, cholera appeared for the first time in a village of the Purandhar Táluka in the Poona District, and between this date and the 28th there were 14 attacks and 6 deaths. In the town of Ratnagiri the disease continued from 1st to 18th, and then ceased, but on the 3rd it appeared in a village of the Sangameshvar Táluka: there were, in the district, 34 attacks and 16 deaths. The city of Bombay itself contributed 28 cases and 17 deaths. In the Thána District the disease was of a somewhat severe type, as it prevailed in 5 tálukas, and in the town of Panvel there were 382 attacks, of which 312 ended fatally. Thus the disease during the month was present in 4 districts, and there were 458 attacks and 351 deaths—the percentage of the latter to the former being as high as 76·64, whilst the percentage to the total deaths from all causes was 1·09. The average number of deaths from cholera for the corresponding month in the 16 preceding years was 1,043, and the ratio per mille of population during the month was 0·02, whilst the mean ratio of the above period during March was 0·07. Although the disease was present in 4 districts only during the month, its intensity was severe.

April.

14. On the 1st April the disease appeared in a village in the Mával Táluka of the Poona Zilla. On the 14th it was in the Purandhar Táluka, and on the 15th and 17th in the Indápur Taluka. It lasted the whole month in this district, during which time there were 43 attacks and 16 deaths. In the Sátára Collectorate it re-appeared after 2 months. Here on the 4th it appeared in a village in the Tásgaon Táluka, and spread rapily in several villages in the Válva, Sátára, Pátan and Khatáv tálukas, the total for the district being 916 seizures and 424 deaths. From Sátára it travelled to the Belgaum Collectorate *vid* Nándgaon in the Gokák Táluka, where it appeared on the 5th. Ten days afterwards it showed itself in

the Chikodi Táluka, and soon after it attacked 18 other villages in the same táluka. In the last week of the month, Belgaum and Athni tálukas were slightly affected, the record for the whole district being 535 attacks and 241 deaths. In the Ratnágiri Collectorate we find that from 5th to 30th the disease lasted in the two tálukas, and there were 12 cases and 7 deaths. From the city of Bombay 11 fresh cases and 5 deaths were reported. In the Thána Zilla the disease lingered in two tálukas only—Sálsette and Panvel, and in the town of Thána itself; there were 106 attacks and 60 deaths for the district. On the 7th, it appeared in the town of Surat, and between this date and the 10th there were 2 seizures and 1 death. Thus the disease during the month was present in 7 collectorates. The attacks and deaths for the month were 1,625 and 754 respectively—the percentage of the latter to the former being 46·40, whilst their percentage to the total deaths from all causes was 2·88. The average number of deaths from cholera during April for the 16 preceding years was 1,810. The ratio per 1,000 of population during the month was 0·04, whilst the mean ratio for the 16-year period was 0·12.

15. During this month the disease continued in the Indápur Táluka of the Poona District, and on the 8th, 12th and 20th it appeared, respectively, in 3 villages of the Sirúr Táluka in the same district. On the 25th a man was attacked in the Poona City who died on the following day: the total for the district was 58 attacks and 24 deaths. It then spread to the adjoining collectorate of Sholápur, which was free from cholera until 10th, but on this day it visited Koogaon in the Karmála Táluka, and two other neighbouring villages were afterwards slightly affected: there were in the district 16 seizures and 4 deaths. In the Sátára District it continued in 5 affected circles, and it broke out afresh in 6 others. The disease lasted in this district throughout the month, and was of a severe type, as there were 1,924 attacks and 787 deaths. Similarly, 8 out of 11 registration circles in the Belgaum District were attacked, and there were 1,680 attacks and 805 deaths. The Dhárwár District had been hitherto exempt from cholera, but on the 13th May it appeared in a village of the Karajgi Táluka, and between this date and 26th there were 20 seizures and 7 deaths. The Kaládgi Collectorate was also free from the disease up to the 19th, but on this day it was reported from Galagali, a village in the Bágalkot Táluka. Within a week from this date it spread to two other villages in the same táluka, and in one of the Bijápur Táluka; the attacks and deaths were 69 and 33 respectively. On the 10th and 11th it attacked two villages of the Dápoli Táluka and continued in one in the Chiplún Táluka of the Ratnágiri District. There were 14 attacks and 9 deaths. In the city of Bombay one fatal case out of 3 attacked was registered. The whole of Gujarát was free from this disease till the 4th of this month, when it appeared in one of the villages in the Viramgám Táluka of the Ahmedabad District and subsequently 8 other villages were more or less affected in the same táluka. There were also some few cases reported from 5 other circles in the district, the total of attacks and deaths being 326 and 162 respectively. On the 27th, 4 cholera cases were reported from Nagar Párkar Táluka of the Thar and Párkar District in Sind, 3 of which proved fatal on the following day. Thus the disease during the month was present in 10 districts, and the maximum mortality for the year was reached. The attacks and deaths for the month were 4,114 and 1,835 respectively,—the percentage of the latter to the former being 44·60, whilst their percentage to the total deaths from all causes was 6·48. The average number of deaths from cholera for corresponding month in the 16 previous years was 2,890. The ratio per mille of population during the month was 0·11, whilst the mean ratio for the corresponding month of the above 16-year period was 0·19.

May.

16. On the 2nd June the disease re-appeared, after being about for 4 months in a village of the Párner Táluka in the Ahmednagar District. On the 13th it broke out in a neighbouring village and lasted till the end of the month, during which period there were 48 attacks and 16 deaths. It lingered in one village only of the Sirúr Táluka in the Poona Collectorate, and between 23rd and 30th there were 14 fresh cases, 8 of which proved fatal. On the 10th, 22nd and 27th it was present in one village of each of the following tálukas, *viz.*, Karmála, Sángola and Sholápur tálukas of the Sholápur Collectorate, the monthly total being 33 seizures and 19 deaths. In

June.

the Sátára District it continued in all circles affected in the preceding month, except Jávli, Khatáv and the town of Sátára, but it appeared afresh in one village of the Mán Táluka and in the town of Wái; the total for the district amounted to 743 attacks and 316 deaths. In the Belgaum Collectorate also it continued in 6 circles previously affected, but disappeared from the Belgaum Táluka; 157 deaths out of 308 attacks were recorded. On the 3rd and 20th one fatal case was respectively reported from a village in each of the Nárgund and Karajgi tálukas in the Dhárwár District. From 1st to 30th it continued in 5 circles of the Kaládgi District with increased severity, as there were 366 fresh cases and 163 deaths, against 69 and 33 in the preceding month. From 1st to 23rd it was in a village of the Devgad Táluka in the Ratnágiri District, causing 10 attacks and 6 deaths. In the Thána and Surat Districts the disease re-appeared after a cessation of one month, and there were 49 attacks and 34 deaths in the former and 5 attacks and 5 deaths in the latter. In the Ahmedabad District it prevailed in every registration circle except Gogha Táluka, and the town and the cantonment of Ahmedabad, and the disease continued with unabated severity: 835 persons were attacked and 444 succumbed. Thus during the month the disease was present in 11 districts. The attacks and deaths for the month were 2,413 and 1,170 respectively, the percentage of the latter to the former being 48·49, whilst their percentage to the total deaths from all causes was 4·87. The average number of deaths from cholera for the corresponding months in the 16 previous years was 3,478. The ratio per mille of population during the month was 0·07, whilst the mean ratio for the corresponding period was 0·23.

17. Until 13th July, cholera was absent in the Násik District, but on this date it appeared in the town of Nándgaon, where there is a railway station. By the 14th it travelled to a village in the Igatpuri Táluka, by the 15th to a village in the Násik Táluka, and a week afterwards to the town of Násik, the total for the district being 80 attacks and 15 deaths. In the Ahmednagar District it prevailed in the Párner Táluka previously affected, and appeared afresh in 5 villages of the Shrígonda Táluka and in the cantonment of Ahmednagar,—128 cases and 49 deaths being recorded. On the 2nd, 4th and 6th it appeared for the first time in a village in the Bhimthadi Táluka, Poona City, and the Civil Line near the city in the Haveli Táluka, respectively. On the 23rd it appeared in a village of the Indápur Táluka, the monthly total for the district being 32 cases with 15 deaths. The disease was present in all tálukas and towns of the Sholápur Zilla, except the Karmála Táluka, from 4th to 31st of the month, during which time 378 persons were seized, 161 of whom died. In the Sátára Collectorate the whole area was invaded, with the exception of the Jávli Táluka and the town of Sátára, and there were 706 fresh cases, 323 of which proved fatal. In the Belgaum District it lingered in a village of each of the tálukas Chikodi and Gokák, but spread in the Athni Táluka, causing 241 attacks and 82 deaths in all. In the Kaládgi Collectorate it continued unabated in the previously affected tálukas, and appeared afresh in 2 villages of the Sindgi Táluka: 242 seizures and 119 deaths were registered. In the city of Bombay it was present from 5th to 29th, and there were 13 fresh cases and 12 deaths. In the Thána District it was confined to Sálsette, Panvel and Karjat tálukas, in which there were 101 attacks and 70 deaths. A fatal case was reported on the 6th from the town of Ránder in the Chorási Táluka of the Surat Collectorate. The disease appeared in the Kaira District, which had hitherto escaped. On the 18th of this month, and between this date and 31st, there were 16 attacks and 6 deaths. In the Ahmedabad District it prevailed in 6 circles previously affected, and appeared to be gradually subsiding, although there were 103 fresh cases and 55 deaths. Thus during the month the disease was present in 12 districts. The attacks and deaths for the month were 2,040 and 908 respectively, the percentage of the latter to the former being 44·51, whilst their percentage to the total deaths from all causes was 3·41. The average number of deaths from cholera for the month of July in the previous 16 years was 3,379. The ratio per 1,000 of population during the month was 0·06, whilst the mean ratio for the 16 corresponding months of the above period was 0·22.

July.

18. On the 1st August, cholera made its appearance for the first time in the Khándesh District. It broke out in the Chopda and Bhadgaon tálukas, but subsequently spread more or

August.

less to 6 other tálukas, causing in all 196 attacks and 86 deaths. In the Násik District it was widespread, as 311 persons were reported to have been attacked in 6 tálukas and in the town of Násik, of whom 96 died during the month. In the Ahmednagar Collectorate it was confined to the Parner and Shrigonda tálukas previously affected, and appeared afresh in a village of Jámkhed and 6 of Shevgaon Táluka,—129 attacks and 60 deaths having taken place. In the Poona District it continued in Bhiwndi, re-appeared at Sirúr, and travelled as far as Junnar, there being 84 attacks and 45 deaths in the 3 tálukas and the city of Poona. The whole area of the Sholápur District, except the táluka of Pandharpur, was invaded, and 223 deaths out of 528 attacks took place. In the Sátára District it continued in 11 circles affected in the preceding month, and re-appeared after two months in the town of Sátára; there were 548 attacks and 255 deaths. In Belgaum it continued during the first half of the month in two villages of the Athni Táluka, and in the latter half in two villages of the Chikodi Táluka, causing 39 attacks and 20 deaths in all. In the Kaládgi Collectorate it continued in 4 affected tálukas, disappeared from one, but appeared afresh in two, the monthly total being 294 and 124. On the 21st it re-appeared in the Pen Táluka after having been absent for 5 months, and between this date and 31st there were 7 attacks and 3 deaths. In the city of Bombay itself 15 cases with 12 deaths took place. In the Thána Collectorate it was present in 4 registration circles, and there were 143 seizures and 85 deaths. In the Kaira District it was widespread in the Kapadvanj Táluka, but very slight in the Nádiad Táluka: during the month there were 272 attacks and 138 deaths against 15 and 6, respectively, in the preceding month. In the Ahmedabad District it lingered in a village of the Viramgám Táluka and in the town of Ahmedabad, 16 attacks and 9 deaths being recorded. Thus during the month the disease was present in 13 collectorates. The attacks and deaths for the month were 2,582 and 1,156 respectively; the percentage of the latter to the former being 44·77, whilst their percentage to the total deaths from all causes was 3·86. The average number of deaths from cholera for the corresponding month of previous 16 years was 2,920. The ratio per mille of population during the month was 0·07, whilst the mean ratio for the corresponding month of the period was 0·19.

September.

19. From the beginning of September cholera began to decline in the Khándesh District. It remained in 5 villages in 3 tálukas only, and the monthly total was 35 attacks with 12 deaths. In the Násik District it not only continued to prevail in 7 circles previously affected, but attacked the tálukas of Nándgaon, Kalvan, Igatpuri and Niphád: there were 326 fresh cases, 148 of which terminated fatally. In the Ahmednagar District there was a marked decline: it was present from 11th to 30th, and there were 35 cases with 21 deaths reported from 4 tálukas. In the Poona District the disease prevailed to the same extent as in the preceding month, as there were 82 attacks and 43 deaths against 84 and 45. A marked decrease, however, was observed in the Sholápur District during September, as compared with the preceding month, as the figures recorded were 114 cases with 54 deaths, and 528 cases with 223 deaths respectively. In the Sátara District it continued in 8 affected tálukas, and there were 468 fresh cases and 187 deaths in all. In the Belgaum Collectorate, although cases were reported from 3 tálukas, the type was not severe, as there were only 8 fresh cases and 7 deaths in the district. In the last week of the month cholera re-appeared in the Dhárwár District, being a revitalization after 2 months' absence: 7 attacks and 6 deaths were reported from 3 villages of the Navalgund Táluka. In the Kaládgi District it was present in 4 tálukas previously affected, and appeared afresh in one: there were 51 attacks and 25 deaths. In the city of Bombay 10 fresh cases with 8 deaths were recorded. A village in Sálsette, Panvel and Karjat tálukas respectively was affected, and there were 8 deaths out of 11 attacks between 1st and 12th. Only one fatal case was registered on the 26th in a village of the Hánsot Táluka of the Broach Collectorate. In the Kaira District it continued in 3 tálukas and appeared afresh in one, the total being 156 attacks and 192 deaths. On the 15th, a woman was attacked, but recovered the same day. Thus during the month the disease was present in 14 districts. The attacks and deaths for the month were 1,305 and 612 respectively,—the percentage of the latter to the former being 46·90, whilst their percentage to the total deaths from all causes was 2·12. The average

number of deaths from cholera for the corresponding month of the previous 16 years was 1,471. The ratio per mille of population during the month was 0·04, whilst the mean ratio for the corresponding month of the period was 0·10.

October. 20. The disease was present in 4 tálukas of the Khándesh District during October from 1st to 21st, when it subsided,—the record for the month being 50 fresh cases and 20 deaths. In the Násik District it began to decline gradually, and only 80 attacks and 38 deaths were recorded. In the Ahmednagar District it continued in one táluka, appeared afresh in another, and re-appeared in another, the attacks and deaths being 63 and 23. In the Poona, Sholápur and Sátára collectorates it continued throughout the month; and 80 attacks and 37 deaths, 30 attacks and 19 deaths, and 200 attacks and 90 deaths, respectively, were recorded. A village in each of the tálukas Athni and Chikodi was attacked, and 5 deaths took place out of 14 seizures. In the Kaládgi Collectorate the number of attacks and deaths was greater than in the preceding month, as the numbers were 174 and 67 against 51 and 25 of last month. Three villages of the Mángaon Táluka in the Kolába District were attacked on the 3rd, 7th and 9th respectively, and 13 cases with 12 deaths in all occurred. In the City of Bombay 2 persons were affected, both of whom died. In the Kaira District it continued in one táluka, appeared afresh in another, and re-appeared after a month's absence in the town of Kaira: 32 deaths out of 62 attacks were reported. In the Ahmedabad District it was confined to 3 villages of the Dhandhuka Taluka, and between 4th and 29th 46 attacks and 17 deaths took place. Thus during the month the disease was present in 12 districts. The attacks and deaths for the month were 814 and 362 respectively,—the percentage of the latter to the former being 44·47, whilst their percentage to the total deaths from all causes was 1·22. The average number of deaths from cholera for the corresponding month of the previous 16 years was 1,024. The ratio per mille of population during the month was 0·02, whilst the mean ratio for the corresponding month of the period was 0·07.

November. 21. In this month in the Násik District cholera was present in a village of the Násik and Nándgaon tálukas respectively, and the attacks and deaths were 20 and 4. Similarly it was present in a village of Jámkhed and Karját tálukas of the Ahmednagar District, the total attacks and deaths being 32 and 6. From 4th to 16th it was in one village only of the Khed Táluka in the Poona Zilla: 6 fresh cases and 5 deaths were recorded. Mán was the only táluka of the Sátára District where the disease was present during the month, and there were 28 attacks and 13 deaths. Between 12th and 30th, 21 fresh cases and 16 deaths were reported from the táluka and town of Belgaum. It re-appeared in the Dhárwar District, and the largest number that occurred here during the year took place in this month. It was in 3 tálukas, and the attacks and deaths were 194 and 89. A rapid decrease was noticed in the Kaládgi Collectorate, as there were only 19 cases and 11 deaths. A fatal case in the Dhandhuka Táluka and another in the town of Ahmedabad took place on the 2nd and 15th, respectively, in the Ahmedabad District. Thus during the month the disease was present in 8 districts. The attacks and deaths for the month were 322 and 146 respectively,—the percentage of the latter to the former being 45·34, whilst their percentage to the total deaths from all causes was 0·44. The average number of deaths from cholera for the corresponding month of the previous 16 years was 491. The ratio per mille of population during the month was 0·01, whilst the mean ratio for the corresponding month of the period was 0·03.

December. 22. In the last week of December it appeared in the town of Bárámati, the head quarters of the Bárámatti peta, a portion of the Bhimthadi Táluka in the Poona Collectorate. There were in all 51 attacks and 12 deaths. It is said to have been imported here from the town of Phaltan (in the Sátára District) situated to the south-west, and about 12 miles distant. The annual Phaltan játrá takes place during the early portion of the month, and pilgrims returning from it are said to have sickened and died at Bárámati. The first case occurred on the 20th, and at the close of the year it was still prevalent. In the Sátára Collectorate the disease was pre-

sent in one village only of the Mán Táluka on the 1st, and there were 8 attacks, but all ended in recovery. A man was attacked and found dead on the 1st in a village of the Belgaum Táluka. In the Dhárwár District it was present in 4 tálukas, and the attacks and deaths here were 49 and 26. One fatal case out of 3 seizures was reported from a village in the Bádámi Táluka of the Kaládgi District on the 10th. On the 18th there was also a fatal case in the city of Bombay. Thus during the month the disease was present in 6 districts only. The attacks and deaths for the month were 113 and 41 respectively,—the percentage of the latter to the former being 36·28, whilst their percentage to the total deaths from all causes was 0·13. The average number of deaths from cholera for the corresponding month in the previous 16 years was 378. The ratio per mille of population during the month was almost *nil*, whilst the mean ratio for the corresponding month of the period was 0·02.

23. The details here given month by month will be found in the subjoined table, which shows, for each month, the attacks and deaths from cholera and the total of deaths from all causes. It also gives the percentage of cholera deaths to attacks and to total deaths :—

Months.	Number of Cholera Attacks	Number of Deaths from		Percentage of Cholera Deaths to	
		Cholera.	All Causes.	Attacks.	Deaths from all Causes.
January	434	272	29,719	62·67	0·92
February	456	297	27,405	65·13	1·09
March	458	351	29,343	76·64	1·19
April	1,625	754	26,208	46·40	2·88
May	4,114	1,835	28,314	44·60	6·48
June	2,413	1,170	24,000	48·49	4·87
July	2,040	908	26,659	44·51	3·41
August	2,582	1,156	29,961	44·77	3·86
September	1,305	612	28,854	46·90	2·12
October	814	362	29,652	44·47	1·22
November	322	146	32,877	45·34	0·44
December	113	41	30,426	36·28	0·13
Total ...	16,676	7,904	343,418	47·40	2·30

Mortality for the Presidency generally.

24. Of our 285 registration circles in the Presidency, 125 were affected, and the total deaths from cholera amounted to 7,904. These deaths were distributed over 18 districts or collectorates and 831 units of registration. The ratio per 1,000 of cholera deaths to the population of the Presidency was 0·48. The following table shows the number of registration circles affected in each district during the year, and their population. It will be seen that out of the 223 rural circles, 55 town circles, and 7 civil cantonment circles, 98, 24 and 3 were respectively affected. Out of 24,535 inhabited villages, 804 were affected :—

Divisions.	Number.	Districts.	Total Number of Registration Circles and their collective Population.				Number of Circles and their Population affected by Cholera				Percentage of affected Population to total Population.
			Talukas or R. C.	Towns or T. C.	Cantonments or Ct. C.	Villages or Units.	Population by Census of 1881.	Talukas or R. C.	Towns or T. C.	Cantonments or Ct. C.	Villages or Units.	Population affected.	
Northern Deccan.	1	Khándesh	22	4	..	2,679	1,737,331	9	1	..	21	96,709	5·57
	2	Násik	12	4	2	1,629	781,299	9	3	..	67	60,417	19·29
	3	Ahmednagar	11	3	1	1,531	731,726	7	..	1	35	31,546	4·31
	4	Poona	9	3	1	1,191	960,021	9	1	1	23	175,977	18·34
	5	Sholápur	7	3	..	709	487,457	7	3	..	53	103,484	21·97
Southern Deccan.	6	Sátára	12	3	..	1,340	1,062,350	11	3	..	236	454,943	42·74
	7	Belgaum	7	3	1	1,573	864,014	4	2	1	46	227,115	26·28
	8	Dhárwár	14	4	..	1,391	892,067	5	..	..	24	34,467	3·86
	9	Kaládgi	8	1	1	1,139	688,493	8	1	..	60	219,865	31·87
Konkan.	10	Kánara	11	2	..	1,107	421,849	..	..	..	..	..	..
	11	Ratnágiri	8	2	..	1,395	997,060	6	1	..	21	63,116	6·32
	12	Kolába	6	2	..	972	281,649	4	1	..	10	24,686	9·07
	13	Bombay City	..	..	..	..	773,196	..	1	..	..	773,196	100·00
	14	Thána	11	3	..	2,098	969,849	6	2	..	53	81,793	9·00
Gujarát.	15	Surat	8	2	..	780	634,196	2	1	..	2	130,397	19·40
	16	Broach	6	1	..	403	320,930	1	..	..	1	566	..
	17	Kaira	7	4	..	677	834,800	4	2	..	29	76,139	9·46
	18	Panch Mahals	5	2	..	673	355,479	..	..	..	..	..	..
	19	Ahmedabad	7	4	1	857	856,324	6	3	..	64	269,759	31·79
Sind	20	Karáchi	13	1	..	722	476,660	..	..	..	..	..	..
	21	Hyderabad	12	1	..	1,194	754,024	..	..	..	..	..	..
	22	Thar and Párkar	7	1	..	73	235,344	1	..	..	2	964	0·41
	23	Shikárpur	12	2	..	1,270	822,986	..	..	..	..	..	..
	24	Upper Sind Frontier	2	*1	..	142	159,181	..	..	..	..	..	..
		Total ..	223	55	7	24,535	16,434,414	99	24	3	804	2,844,656	17·31

* This is a town and cantonment circle.

Mortality by Divisions.

25. All the 5 districts in the Northern Deccan Division were affected, and the attacks and deaths were 3,141 and 1,309 against 22,056 and 10,001 in the preceding year. In the Southern Deccan it prevailed more or less in all 4 districts, and in this division the attacks and deaths were 9,898 and 4,413, respectively, against 3,239 and 1,358. In the Konkan Division including Bombay City—4 out of 5 districts (Kánara being exempt) were affected, and 1,212 deaths out of 1,788 attacks were recorded, the figures for the preceding year being 2,233 out of 3,576. In Gujarát also 4 out of 5 districts (Panch Mahals being free from the disease) were affected, and there were 1,845 seizures and 967 deaths; last year they were 6,011 and 3,102 respectively. There were only 4 cases and 3 deaths reported from the Thar and Párkar District of the Sind Division; the rest of the Province of Sind kept exempt during the year.

Mortality by Sexes.

26. The next table gives the mortality by sexes and the ratios of deaths per 1,000 of population with the mean ratio of the 16-year period. The deaths among females exceed those among males in the Násik, Ratnágiri and Broach districts; in the last-mentioned district only one woman died, whilst in the remaining 15 districts more males died than females. For the Presidency generally there is no great disparity. Of the 7,904 deaths registered during the year, 4,268 were of males and 3,636 were of females: so for every 100 deaths among males there were 85 deaths among females. The ratio per mille of males dying to males living was 0·50, and of females dying to females living was 0·46. Last year they were, respectively, 1·02 and 1·01.

Mortality by Districts.

27. Registering the mortality by districts it will be seen that 18 out of 24 were affected as in the previous year. Both by number and ratios the maximum mortality was in the Sátára District (2,406 = 2·46 per 1,000). In the Belgaum District they were 1,334 = 1·54 per 1,000, and in each of the remaining 16 districts the mortality was under 1,000. The districts in which the mortality was highest are shown in sequence in the following table, and there are also shown the population, the deaths by sexes and the death-rates as well for 1882 as for the 16 years' mean from 1866:—

Number in Margin	Districts.	Population by Census of 1881.			Deaths from Cholera.			Ratio of Deaths per 1,000 of Population.			Mean Ratio for the previous 10 years.
		Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	
1	Sátára ...	532,525	529,825	1,062,350	1,281	1,125	2,406	2·41	2·12	2·26	1·89
2	Belgaum ...	434,485	429,529	864,014	727	607	1,334	1·67	1·41	1·54	2·35
3	Kaládgi ...	317,611	320,892	638,503	281	262	543	0·88	0·82	0·85	2·31
4	Thána ...	468,256	440,312	908,548	391	383	774	0·83	0·87	0·85	1·23
5	Sholápur ...	294,814	287,673	582,487	263	217	480	0·89	0·75	0·82	2·08
6	Ahmedabad ...	439,394	416,930	856,324	407	282	689	0·93	0·68	0·80	0·79
7	Kolába ...	191,052	189,697	381,649	89	60	149	0·46	0·32	0·39	0·86
8	Násik ...	397,404	383,802	781,206	142	159	301	0·36	0·41	0·38	1·06
9	Kaira ...	426,781	378,019	804,800	151	117	268	0·35	0·31	0·33	0·68
10	Bombay City ...	464,763	308,433	773,196	118	72	190	0·25	0·23	0·25	0·74
11	Ahmednagar ...	381,692	369,626	751,228	95	87	182	0·25	0·24	0·24	1·86
12	Poona ...	485,101	445,520	930,621	120	91	211	0·26	0·20	0·23	1·54
13	Dhárwár ...	442,035	440,872	882,907	74	56	130	0·17	0·13	0·15	2·24
14	Khándesh ...	632,468	604,763	1,237,231	71	64	135	0·11	0·11	0·11	1·41
15	Ratnágiri ...	473,053	524,037	997,090	48	51	99	0·10	0·10	0·10	0·48
16	Surat ...	306,015	308,183	614,198	7	2	9	0·02	0·01	0·01	1·18
17	Thár and Párkar ...	112,400	90,944	203,344	3	...	3	0·03	...	0·01	0·27
18	Broach ...	168,482	158,448	326,930	...	1	1	...	0·01	0·00	0·89
19	Kánara ...	223,005	198,835	421,840	...	...	...	...	...	...	1·24
20	Panch Mahals ...	134,162	124,317	259,479	...	...	...	...	...	...	2·06
21	Karáchi ...	265,988	212,700	478,688	...	...	...	...	...	...	0·98
22	Hyderabad ...	407,243	347,381	754,624	...	...	...	...	...	...	0·33
23	Shikárpur ...	461,033	391,953	852,986	...	...	...	...	...	...	0·58
24	Upper Sind Frontier.	70,166	54,015	124,181	...	...	...	...	...	...	0·32
	Total ...	8,497,718	7,956,696	16,454,414	4,268	3,636	7,904	0·50	0·46	0·48	1·31

Khándesh.

28. At the close of 1881 cholera was present in the Pimpalner Táluka of this zilla, and during the year under notice it continued from 1st to 14th January; it then subsided, and the district was free for the next 6 months, but it re-appeared on the 1st August at two different points in the tálukas of Chopda and Bhadgaon. The disease afterwards passed to the north and north-east, breaking out here and there over the country, and for the most part along the line of rail. The disease was most severe during this month. In September it was present only in Páchora and in the Government Model Farm at Bhadgaon, and re-appeared in the Pimpalner Táluka, but with less severity. The disease at the Government Model Farm was attributed to various causes, but it is reported that the water pools are maliciously made foul during the dry season in order to kill the fish, and that the first heavy burst of the monsoon pollutes the whole stream. The Superintendent of the Model Farm says that "the actual poisoners are, as a rule, Bhils; but the confessions of some of those caught in the act of laying poison in our drinking water last March revealed the complicity of the police patel of the neighbouring village. The drug used is the bark of the hingunbet tree *(Balanites ægyptiaca)*, and is applied in the following manner:—If only small fishes are sought for, the bark is merely thrown in the pool, where it floats and stupefies those found near the surface. If, however, *marel* or other large kinds are to be taken, the depths of the pool have to be reached, and this is done by pounding the bark and mixing it up in balls with a tough clay called 'khari matti'; these balls rest on the bottom, where they dissolve gradually, and thus nothing can escape them." In October it continued in Páchora, Bhadgaon and Pimpalner tálukas, and a fatal case was reported from a village named Nádgaon, in the Jámner Táluka. The last case occurred on the 21st October in Pimpalner, a village in the táluka of the same name. The disease attacked the central and eastern portion of the district. The affected area included 9 out of 22 tálukas, 1 out of 4 towns, and 21 out of 2,679 villages; and the population of this area is 36,702, that of the district being 1,237,231: so their proportion to the greater number is 2·97 per cent. The attacks and deaths for the district during the year were 311 and 135 respectively, the percentage of the latter to the former was 43·41, and their ratio to the district population was 0·11 per 1,000 The deaths from all causes were 27,304, and those from cholera were 135.

Násik.

29. Until 13th July, the Násik District was free from cholera during the year, but on this day a few cases, mainly among pilgrims coming from Pandharpur, were reported from a village of 4,416 inhabitants in the Nándgaon Táluka. Next

day it appeared in a village in the Igatpuri Táluka, and on the 15th in a village 4 miles from the town of Násik: some of these cases were only diarrhœa brought on by exposure to wet during the late rain. It broke out in the town of Násik on the 24th. The disease appearing in its south-west corner of the táluka, the town of Nándgaon on the western limits of the district was invaded on the 13th as mentioned above; the remaining tálukas were free during the month. Igatpuri, Násik and Nándgaon are all on the G. I. P. line. In August it still prevailed in the circles previously affected, and passed south to Sinnar, Chándor, Yeola and Báglán tálukas. These three last-named tálukas form a belt running north-west and south-west, and are seperated from the tálukas of Igatpuri, Násik and Sinnar, which occupy the south-west corner, by Dindori and Niphád tálukas; the line of railway, however, connects them. In September the disease continued in all affected circles except Chándor, but appeared afresh in the Niphád and Kalvan tálukas. It was chiefly confined to the south-west portion of the district during the month. From October it decreased, but there were 80 fresh cases with 38 deaths reported from 5 tálukas. In November the disease was present in 12 villages in the Násik and Nándgaon tálukas. The last case occurred on the 15th November in the village of Nándgaon, which was the first attacked in the district. Mr. Ramsay, the Collector, says: "Most of the outbreak occurred in wet weather. People get wet, and probably have no clothes to exchange, and fresh coarse vegetables are much eaten. Most of the drinking water is polluted from some source or other, and probably during the rains more so than at any other time." He also says: "All these causes are sufficient to induce diarrhœa, which sometimes amounts to cholera, but the returns are made out by ignorant persons, and many cases of mere neglected diarrhœa are put down as cholera—many not being reported until after death, when diagnosis is impossible." Regarding the outbreak in the town of Násik the following extract from the report of Honorary Surgeon Lealey is interesting:—"The first case reported at the hospital was that of a woman residing near the police lines, who was attacked during the night of the 24th July. In some of the cases attacked in the beginning of the outbreak I made particular enquiries with the view of ascertaining whether there was any evidence to show that the disease had been introduced into the town from any of the places in the district where cases had occurred before its appearance in Násik, but in no instance had there been communication with any of the infected places. The disease was chiefly confined to that portion of the town extending from Malar Darwaja to Nawápura;—Kajipura, Koknipura and the Dhedwáda, near the old telegraph office, were most free from it. It is noteworthy that the residents in these localities mostly use well water for domestic purposes. The majority of the persons attacked belonged to the poorer class, and were living in crowded, badly ventilated parts of the town. There was often much difficulty in getting the friends of the patients to persevere with treatment. With respect to the probable causes of the outbreak, I regret to say I do not feel in a position to offer any positive opinion on the subject. I would mention, however, that, for about a fortnight before it commenced, rain had fallen daily, and that in many parts of the town the houses occupied by the poorer class were cold and damp; also that when the disease appeared and for some time afterwards vegetables of a coarse and indigestible nature, such as cucumbers and radishes, were plentiful in the bázár, and being cheap were freely used by the people. I have already referred to the comparative immunity from the disease enjoyed by the residents in those quarters of the town who do not use river water for drinking and culinary purposes. It will, no doubt, occur to any reader of this, that the damp state of the houses and the abundant supply of vegetables are conditions met with every monsoon, and yet that cholera does not always occur at the season; also that the water of the river must be more free from impurities in July and August than in December and January." The affected area included 9 out of 12 tálukas, 1 out of 2 towns, and 60 out of 1,629 villages; and the population of this area is 80,417, that of the district being 781,206: so their proportion to the greater number is 10·29 per cent. The attacks and deaths for the district during the year were 817 and 301 respectively, the percentage of the latter to the former was 36·84, and their ratio to the district population was 0·38 per mille. The deaths from all causes were 19,349, and those from cholera were 301.

Ahmednagar.

30. Cholera made its appearance in this district on the 15th January in Garkhindi, a small village of 363 inhabitants in the Parner Táluka. This village is situated at a distance of about 15 miles to the north-west of Párner, and is not close to any of the main lines of roads in the district. The outbreak lasted for 13 days. From 28th January to 2nd June the entire district was exempt, but on that day it re-appeared in the Párner Táluka. And in June a few villages were attacked in the same táluka, which lies close to Sirúr and is traversed by the Poona and Nagar high road. In July two other villages were attacked in the same táluka and 5 villages in the Shrígonda Táluka, which lies to the south of the Párner Táluka and within 4 miles of the station of Belwandi on the Dhond and Manmád Railway. Most of these cases were said to be principally due to the large number of pilgrims from Pandharpur residing there. On the 13th July it reached the cantonment of Ahmednagar. In August it proceeded across the collectorate eastwards, taking all the tálukas *en route*, *viz.*, Nagar, Sheogaon, Karjat and Jámkhed. In September it passed northwards to the tálukas of Ráhuri and Kopergaon, the route by rail and road from Nagar town to Manmád. The type of the disease was very mild during the month; but in October, though present in 3 tálukas, there were 63 attacks and 23 deaths. In November it was confined to two villages in Karjat and Jámkhed tálukas. The last case occurred on the 27th of this month in Pátothi, a village of 864 inhabitants in the Jámkhed Táluka. The affected area included 7 out of 11 tálukas, 1 cantonment, and 35 out of 1,331 villages; and the population of this area is 31,546, that of the district being 751,228: so their proportion to the greater number is 4·19 per cent. The attacks and deaths for the district during the year were 450 and 182 respectively—the percentags of the latter to the former being 40·40, and their ratio to the district population was 0·24 per mille. The deaths from all causes were 14,658, and those from cholera were 182.

Poona.

31. There was no cholera in the Poona District till the 17th March, when it appeared in Kamthadi, a village of 648 inhabitants in the Purandhar Táluka. Here it remained till the 28th, and 3 days afterwards—that is, on the 1st April—an isolated case took place in a village in the Mával Táluka. It then spread to 3 villages in the Indápur Táluka at a distance of about 6 miles from the táluka town—2 of these villages being situated on the banks of the Bhíma, and to one in the Purandhar Táluka during April. In May it continued in the Indápur Táluka, and appeared afresh in 3 villages of the Sirúr Táluka. By the 25th May it reached Poona City. In June it appeared in a single village of the Sirúr Táluka only; but in July, though it disappeared from Sirúr, it re-appeared in the Indápur Táluka and the city of Poona, and broke out in the Bhimthadi and Haveli tálukas. In August, September and October the disease prevailed here and there in 4 circles of the district in an erratic manner. In November it was only in one village of the Khed Táluka, and in December in Bárámati, a large village in the Bárámati Táluka, where the last case occurred on the last day of the year. Here the disease was ascribed to the great annual játrá held at Phaltan (a town about 12 miles distant from Bárámati) in honour of the god Ráma on the 11th December. During this year the pilgrims attending the Alandi Fair were not attacked, but those who attended the Phaltan Játrá suffered. The city of Poona with nearly 100,000 residents only returned 16 attacks and 11 deaths. A severe outbreak occurred in July, August and September, but the disease did not become epidemic. The affected area included 8 tálukas, 1 out of 2 towns, 1 cantonment, and 33 out of 1,184 villages; and the population of this area is 175,977, that of the district being 900,621: so their proportion to the greater number is 19·54 per cent., nearly one-fifth of the total population. The attacks and deaths for the district during the year were 464 and 211 respectively, the percentage of the latter to the former was 45·48, and their ratio to the district population was 0·23 per mille. The deaths from all causes were 16,071, and those from cholera were 211.

Sholápur.

32. Cholera did not appear in the Sholápur Collectorate until the 10th of May; but on this day it broke out in Koogaon, a village of 289 inhabitants in the Karmála Táluka. Next day it spread to a village in the neighbourhood, and on the 25th to another village in the same táluka. In June the disease continued in the Karmála Táluka, and

advanced to 2 other adjacent tálukas—Sholápur and Sangola. In July it disappeared from the Karmala Táluka, but was present in 6 other tálukas and 3 chief towns—Sholápur, Bársi and Pandharpur. In the town of Sholápur the first case took place on the 18th July in the Návi Peit. In this town the great sanitary want, as stated by the Huzúr Deputy Collector, is drainage. At Pandharpur the first case occurred among the residents of the town on the 6th July,—that is, immediately after the Ashádhi Fair; between the date of its first appearance and the 31st there were 91 seizures and 50 deaths in this town. Assistant Surgeon Shantaram Vinayak Kantak reports: "In the majority of the fatal cases the medical treatment was imperfect as usual, the largest proportion resorting at the outset to all sorts of quack treatment, including sorcery and other equally absurd and, if possible, more ridiculous modes of treatment. In several cases English medicines were forced upon them when they were *in extremis*, and not a few pretended to take our medicines, whereas they were actually under the treatment of a quack." In August the disease invaded every táluka of the collectorate except Pandharpur. From the 1st September it began to decline, but was present in 6 tálukas. In October it was only in the two tálukas, Sholápur and Sángola. In the last-named locality the disease died out on the 31st of this month. The affected area included 7 tálukas, 3 towns and 59 out of 709 villages; and the population of this area is 162,894, that of the district being 582,487: so their proportion to the greater number is 27·97 per cent., which is more than one-fourth of the total population. The attacks and deaths for the district during the year were 1,099 and 480 respectively, the percentage of the latter to the former was 43·26, and their ratio to the district population was 0·82 per mille. The deaths from all causes were 11,063, and those from cholera were 480.

Sátára.

33. In the Sátára District the disease was present in December of 1881, and continued in January of the year under report. It was only in one village, named Charegaon, in the Karád Táluka from 10th to 27th. On the 4th April it appeared in Bhilávádi, a village in the Tásgaon Táluka, and on the following day it attacked another village on the Poona and Sátárá mail road about 8 miles from the Sadar station. On the 10th it suddenly broke out in the Valva Táluka, and Dr. Channer was ordered to proceed there. He visited some of the affected villages, and attributed the causes of the outbreak to infection from Kolhápur, a Native State, in the neighbourhood—spread by unknown conditions, predisposed to by heat and scarcity of drinking water. His report itself is given below:—

"1. The 'Valva Táluka' is the southernmost táluka of the Satára District. To the south and south-east lies the Native State of Kolhápur, where cholera has been prevalent, and from whence it is supposed to have attacked Valva. To the north lies Pátan, Karád and Khánápur tálukas. To the west Tásgaon and Miraj.

"In all these districts cholera has been prevalent,—to what extent in Kolhápur, I have not the means of stating, as the 'Political Resident in charge' has not forwarded any returns.

"2. During the month of April and until rain fell in May the water-supply of the villages in this táluka was scarce, and it is conceivable that this may have been one of the predisposing causes of the outbreak, for towards the end of May the disease subsided to a great extent,—the heavy rain which fell having decidedly an effect on the disease.

"3. The first case occurred in the village of 'Kameri' situated on the Poona road: here with a population of 3,493 there were 228 attacks and 187 deaths, giving a percentage of 60·2 deaths to attacks. On visiting this place I made particular inquiries as to the origin of the outbreak. It appears from the account given me by the patel and the relations of the deceased, a Marátha woman, that she had been to Kolhápur on the 13th of April, and had returned sick, showing symptoms of the disease on the 14th April, and died the following day. The house or rather hovel she lived in, was low and badly ventilated. The following day (16th) a man living on the opposite side of the road was attacked and died; subsequently the disease spread irregularly in the town. The water-supply at this time was scarce, but there is not evidence to show that it was the means of propagating the cholera poison.

"4. On the 17th April 'Kurlap', a village within 2 or 3 miles of the Poona road, was attacked, and during this week 'Bagin', 'Valla', 'Ashteh', 'Nirla' and 'Oorum'—all large towns—became affected; the disease then spread throughout the greater part of the táluka.

"5. The following statement gives the population (1872) and the number of villages in the táluka, the number of villages attacked, with percentage, number of attacks and deaths, with percentage of deaths to attacks, and, lastly, the incidence of the disease per mille of population:—

Táluka.	Population of 1872.	Villages.	Attacks.	Percentage of Villages attacked.	Number of Persons attacked.	Deaths.	Percentage of Deaths to Attacks.	Attacked per Mille of Population.
Vaiva	136,089	136	39	48·07	1,881	889	47·45	13·82

"Thus more than ¼ of the villages in the whole táluka suffered, and nearly ½ of those attacked died, the average mortality in cholera in spite of all treatment.

"6. * * * * * *

"7. From the position of the villages attacked there is nothing to show the disease had a predilection for one place more than another. There are two rivers flowing partially through this tract of country—the 'Krishna' to the north-east, 'Varna' to the south; villages have been attacked along their banks to a small extent, but the greater portion situated in the area between these rivers have suffered most. Adjacent villages have been attacked in one place and escaped in another; there is nothing, apparently, constant in the location of attack.

"8. Whenever I enquired concerning the origin of first cases I was informed that the individual had been to some cholera-infected spot and had returned with the disease; but when I pressed the inquiry, and tried to ascertain whether the attacked had had communication or not with the infected cases, the evidence became altogether unsatisfactory and unreliable. I would suggest that patels be instructed to write down carefully the previous history of all first cases of cholera at the time of attack.

"9. The origin of the epidemic may be said to have been in Kolhápur, which infected 'Kameri'; then the disease spread in the táluka. It is probably part of the epidemic affecting this portion of the Deccan, and due to unknown causes, but probably greatly predisposed to by the scarcity of drinking water during April and part of May, together with the usual insanitary condition of villages. Why one group of villages in this táluka has escaped, whilst another similar group has been affected, there is no evidence to show.

"10. I personally visited 'Peth', the head-quarter of the táluka, besides 'Oorum" (municipal town), Islámpur, the large village of Kameri, and the filthy town of Nirla situated on the Deccan trap close to the Poona road.

"11. The Mámlatdár and Faujdár had made the best sanitary arrangements the means at disposal permitted: supplies of sulphur and dammer, a little disinfecting powder, together with Government medicines were sent by sepoys to the affected villages, and instructions given to patels to cleanse, report cases as they occurred, and guard the water-supply. The clothes of the dead were burnt. In some cases medicines did not arrive as quickly as might have been desired; and whilst visiting the town of Oorum I found a case of cholera, medicines had only then arrived, although indented for by the Medical Officer in charge of the Islámpur Dispensary, as he stated, two months before.

"12. Skilled medical assistance was afforded by the Hospital Assistant, Islámpur Dispensary, to Oorum and the neighbouring villages Nirla and Kameri in particular. I did not hear of any Hospital Assistant having been sent on special duty to this táluka, as should have been the case.

"13. From the mortality—nearly 50 per cent.—I am afraid medicine has been of little use in treatment; and in many houses I visited, lime-washing had been altogether neglected,—in fact, the Mámlatdár said little attention had been paid

to this. The people find a difficulty in applying it, and use instead grey earth, called by them 'Pandri Matti'. This I saw had been applied in many houses.

"14. The causes of the outbreak may be summed up as 'infective from Kolhápur Native State'; and spread by conditions unknown, possibly contagion, and predisposed to by heat and scarcity of drinking water, and that the sanitary measures adopted were fumigation and disinfection of houses, cleansing of villages, and protection of water-supply, together with the medical treatment by sedatives and stimulants."

(Signed) O. H. CHANNER,
Deputy Sanitary Commissioner, S.D. R.D.

In the latter week of April the disease spread to 5 tálukas, and on the 24th reached the town of Sátára. The disease was very virulent throughout the month of May, particularly in the Valva Táluka, where the deaths had amounted to 446 out of 1,083 attacks. In June it continued in 9 affected circles, disappeared from 3, and appeared afresh in 2; but the type of the disease was considerably milder. In July it continued in 10 affected circles, and disappeared from the town of Wai, but re-appeared in the Khatáv Táluka. From August it gradually decreased till the end of October. In November it was limited to 3 villages of the Mán Táluka, and in December it lingered in Mardi village of the same táluka, where the disease died out on the 3rd. The affected area included 11 out of 12 tálukas, 3 towns and 236 out of 1,340 villages; and the population of this area is 454,043, that of the district being 1,062,350: so their proportion to the greater number is 42·74 per cent. The attacks and deaths for the district during the year were 5,561 and 2,406 respectively, the percentage of the latter to the former was 43·26, and their ratio to the district population was 2·26 per mille. The deaths from all causes were 24,035, and those from cholera were 2,406.

Belgaum.

34 This district was free from cholera for the first quarter of the year, but on the 5th April a sudden outbreak in an epidemic form was reported from Nándgaon, a village in the Gokák Táluka. On the 14th it appeared in another village in the same táluka and simultaneously broke out in the town of Hukeri in the Chikodi Táluka. Within a fortnight from this date it spread rapidly to 18 other villages in the same táluka, 2 more in the Gokák Táluka, 2 in the Belgaum Táluka, 1 in Athni Táluka, and the town and cantonment of Belgaum. But in the Chikodi Táluka its ravages were most severe. The Deputy Sanitary Commissioner, Surgeon Channer, visited this táluka and submitted the following report:—

"1. Chikodi Táluka is situated towards the north of the Belgaum Collectorate, bounded on the west and north by the Kolhápur Native State, on the north-east by the Athni Táluka, on the east by the Gokák Sheral tálukas, and on the south by the Belgaum and Gad Hinglaj tálukas, Sháhápur Jaghirdár, and part of Gokák tálukas.

"It is well watered, the 'Krishna' receiving the 'Dudhganga' and 'Vedganga' rivers flowing across the north portion and the 'Harankasi' and 'Ghatprabha' rivers flowing across the south of the district.

"There was scarcity of water during April and May and until the monsoon broke, with the exception of Hukeri town, which always has a plentiful and pure supply of spring water.

"2. Hukeri Mahál is a sub-division of the Chikodi Táluka situated on the southern portion of the district.

"3. The first outbreak of cholera occurred on the 14th April, when 3 persons were attacked in the town of Hukeri, 1 died. On the 15th April Sadalgeh and Shumenehvádi were attacked almost simultaneously as Hukeri, although situated in opposite parts of the district. The disease then became distributed over the district.

"4. The following table gives the population of the district, number of villages, number of villages attacked, and percentage; also number of attacks and deaths, and percentage:—

Name of Táluka.	Population.	Villages.	Villages attacked.	Percentage.	Number of Persons attacked 14th April to 19th June.	Deaths.	Percentage of Deaths to Attacks.
Chikodi and Hukeri Mahál ...	248,685	216	46	21·38	1,654	704	42·50

"5. Thus nearly one-fourth of the villages in the whole district were affected, and nearly one-half of those persons attacked died. The number of villages and persons attacked together with the mortality was high.

"6. Localisation and distribution.—From the position of the villages attacked there appears to be a tendency for the disease to have somewhat localised itself on the banks of the rivers. In the north there are 7 villages, viz., Akerwat, Takli, Rajápur, Sholápur, Chándor, Yedur, and Sadalgeh grouped on the banks of the 'Krishna': nevertheless the village of Monjri, situated between Yedur Dupulji, escaped.

"Again on the banks of 'Vedganga' and 'Dudhganga' rivers there are no less than 19 villages attacked, nearly all adjacent; but yet intermediate villages escaped. Lastly, to the north on the 'Harankási' and 'Ghatprabha' there are 10 villages attacked; but 2 villages situated between Hukeri and Sonkesvar, both badly affected with cholera, remained unaffected. Elsewhere towards the centre of the district villages are irregularly, apparently capriciously, attacked.

"7. Origin of epidemic.—As the first case is reported to have originated in 'Hukeri' town I made strict inquiries on the spot, and visited the affected houses. Two women and one Mahomedan were attacked, but the evidence as to their contamination with pre-existing cases is unsatisfactory. The patel informs me the two women had been to 'Yamkanmardi', where cholera is not reported to have occurred until the 29th May. On their return they were attacked. One of the women, a Lingáyat, had been to 'Yamkanmardi' for cloth, and told her husband on her return that there was cholera at 'Taneh Hatargi', where cholera is reported to have broken out on 18th April. The Mahomedan, living in quite a separate quarter of the town in the old fort, was attacked; but whether he had communication or not with cholera-affected areas, it is impossible to find out.

"The disease subsequently became irregularly distributed over the town, there being 20 attacks and 9 deaths, the last case occurring 29th May, although in examining the patel's register I found it entered 5th June,—his explanation being that on that date every one had gone to their fields. The people in the bázár of Yamkanmardi told the Lingáyat woman, who died, that there was cholera in the adjacent town Taneh Hatargi, but the patel's register shows that the first case occurred there on the 18th April.

"8. The disease broke out in the north about the same period (15th April) in Sadalgeh and Shumenehvádi, and the Mámlatdár informed me it had been brought from Kolhápur. During the latter part of April, throughout May, and part of June the disease prevailed, attacking 46 villages. It seems now to have altogether abated, except in Chikodi and Akol, where a few cases still occur.

"9. Towards the end of May heavy rain fell, and with it the disease seems to have disappeared.

"10. Sanitary measures and medical treatment.—On visiting Chikodi town, which lies about the centre of the district, the Mámlatdár informed me he had issued orders on the first report of cholera to have affected villages cleansed, and sent cholera mixture with and without opium to the sick, together with disinfectants and sulphur. He obtained medicines from the Civil Hospital, Belgaum, and employed the police sepoys to aid in administering medicines. He also employed the services of the Hospital Assistant who is to have charge of the Chikodi Dispensary about to be opened.

"11. I visited personally Chikodi, the head-quarter station, and Hukeri, the head-quarter of the Hukeri Mahál, besides the large town of Sankeshvar on the Poona road in addition to several smaller villages in the district. In all, excepting Hukeri, the sanitation was bad, particularly so in Sankeshvar, where the houses are greatly crowded and the streets very narrow: here cholera was particularly severe—169 attacks and 77 deaths. The town is surrounded with prickly pear, lies very low on the river-bank, and the place is excrement-sodden from one end to the other. In company with the local authorities, village patels, kulkarnis, &c., I visited the cholera-stricken localities, and made particular inquiries as to what medicine the sick had received, and who administered it. I was informed the patel himself, the police sepoys, and, later on about 6th June, a Hospital Assistant had treated the sick. I was shown two black bottles—one without cork and the other with the cork floating in the mixture. They did not know the difference between the contents of the bottles, and, therefore, the administration of medicine in their hands was dangerous, inasmuch as one bottle contained opium, the other did not. Now it is not intended that the opium mixture be administered in the collapse stage of cholera. It is, in fact, exceedingly dangerous to give it then, as it only hastens the end.

"These local officials had no measures to ascertain the quantity to be given; therefore the amount they gave could not be ascertained accurately. On one of the bottles the label of directions in English and Maráthi was torn down to centre.

"I quote the above in full, as it is one instance amongst many that I have seen of the administration of medicines by local village authorities.

"Last year I drew attention to this whilst on cholera duty in Thána, and Government passed a resolution requesting that proper precautions in sending out the medicines to the village patels should be taken.

"The above statement shows how this has been carried out.

"The Mámlatdár of Chikodi informed me, he had received 15 or 20 little tin measures which he issued with the cholera mixtures. I find the measure is divided so as to contain an ounce in the upper part and half an ounce in the lower.

"12. Registration of first cases of cholera should have the strictest attention; as, if they are not registered accurately, the data on which reports have to be made become inaccurate, and no reliable deductions can be made thereon. Now in 'Yamkanmardi', where the Lingáyat woman had been from Hukeri, no cholera was registered until 29th May, although there were 2 cases of cholera supposed to have been unregistered. And, again, in Taneh Hatargi cholera did not break out until 18th April, so the patel states; yet a woman goes to these villages on the 13th April, returns to her town, and dies.

"I would suggest that all village patels be warned to accurately note down first cases with great care, and also to furnish information as to the previous history and doings of the affected persons.

"13. In conclusion I must state that the Mámlatdár and local authorities have done their best to cope with the epidemic, and I found nearly all the poor people say that they were anxious for medicine, and nearly all received aid; but I would suggest that in future, when cholera becomes epidemic in the táluka, one or more qualified medical officers be deputed to visit the cholera cases, perigrinating from village to village with medicines, disinfections, &c., explaining to the local officials how to administer the cholera medicines, and giving advice at the time it is most required. I have little faith in treatment at the hands of police sepoys, village patels and kulkarnis, however zealous and well-meaning they may be; and, unless carefully superintended, the administration of medicines at their hands must be attended with little good, not to say danger, when opium is employed."

(Signed) O. H. CHANNER,

Deputy Sanitary Commissioner, S.D. R.D.

In the month of May it continued in all the affected localities, notably in the Chikodi Táluka, and appeared afresh in 14 villages of the Gokak Táluka. On the 24th it reached the town of Athni. In June it ceased in the táluka of Belgaum and the cantonment of it, but continued in the remainder. The heavy rainfall at this time in the district had apparently had a good effect; for Mr. Jervoise, the Collector, remarked that the number of fresh cases was decreasing. From this month the disease gradually declined till the month of September, when it again became prevalent. In October it was present in 2 villages—one in Athni and Chikodi tálukas respectively, and in November it was confined to a village in the táluka and the town of Belgaum. In the town a woman was taken ill, but concealed her condition. It was stated that her husband died on the 9th, shortly after his return from Hubli. On the 1st December a fatal case was reported from Bagevádi, a village in the Belgaum Táluka, and this was the last case in this district during the year. The affected area included 4 out of 7 tálukas, 3 towns, 1 cantonment, and 96 out of 1,073 villages; and the population of this area is 227,113, that of the district being 864,014: so their proportion to the greater number is 26·28 per cent. The attacks and deaths for the district during the year were 2,847 and 1,334 respectively, the percentage of the latter to the former was 46·86, and their ratio to the district population was 1·54 per mille. The deaths from all causes were 20,015, and those from cholera were 1,334.

Dhárwár.

35. There was no cholera in this district for the first 4 months of the year; but on the 13th May it appeared in Konanlambgi, a village in the Karajgi Táluka. Dr. Channer, the Deputy Sanitary Commissioner, who was then in the neighbouring táluka, says: "A tremendous thunderstorm broke over this part of the district. Since then there has been very heavy rain with thunder and lightning up to 22nd May, rendering it almost impossible to be in tents." In June there were only 2 cases—one in a village in the Nárgund Táluka and the other in another village in the Karajgi Táluka; both terminated fatally on the 3rd and 20th respectively. In July and August the district was free, but in September 3 villages in the Navalgund Táluka were attacked. On the 10th November it appeared in a village in the Navalgund Táluka, and within a week visited 5 other villages. From the inquiries instituted about the causation of this disease the evidence points to the contamination of the nála water as the most probable cause of the epidemic. All these affected villages are dependent for their water-supply on this nála, on the banks of which they are situated. This is called Handigun nála formed by the junction of two other nálas near Kittúr, runs northward, and joins the Benni nála at Tadhal, and is an affluent of the Malaprabha River. The water of this nála was probably polluted by fæcal matter and sewage from the villages through which the Handigun nála and its tributaries pass. The disease also appeared in a village in the Ron Táluka, and 4 other villages were attacked. A fatal case out of 4 attacks, was reported from a village in the Nárgund Táluka. In December cholera continued in 3 tálukas previously affected, and appeared afresh in 5 villages of the Gadag Táluka. The last cases were reported from 3 villages in this táluka. The affected area included 5 out of 14 tálukas and 24 out of 1,281 villages; and the population of this area is 34,667, that of the district being 882,907: so their proportion to the greater number is 3·93 per cent. The attacks and deaths for the district during the year were 262 and 130 respectively, the percentage of the latter to the former was 47·79, and their ratio to the district population was 0·15 per mille. The deaths from all causes were 19,938, and those from cholera were 130.

Kaládgi.

36. Until 19th May there was no cholera in this district, but on this day it was reported from Galagali, a village in the Bágalkot Táluka. Two other villages in the neighbourhood were attacked on the 24th and 27th in the same táluka, and on the same day—that is, on the 27th—it appeared in a village in the Bijápur Táluka. The disease prevailed here in June, and continued in the Bijápur and Bágalkot tálukas and re-appeared in the Indi and Bágevádi tálukas. It broke out in the town of Kaládgi on the 2nd. In July it continued in the affected tálukas, but disappeared from the town of Kaládgi. It broke out for the first time in the Shindgi Táluka. In August the disease prevailed in 4 affected circles, disappeared from

1 (Bijápur), and appeared afresh in the Muddebihál and Bádámi tálukas. From 1st September the type was mild, but in October increased in severity. In November it declined, and in December it was confined to 2 villages in the Bádámi Táluka. On the 10th of this month the last case occurred in Tolachagad, a village in the Bádámi Táluka. The affected area included 8 tálukas, 1 town, and 60 out of 1,139 villages; and the population of this area is 219,868, that of the district being 638,493 : so their proportion to the greater number is 34·43 per cent. The attacks and deaths for the district during the year were 1,218 and 543 respectively, the percentage of the latter to the former was 44·58, and their ratio to the district population was 0·85 per mille. The deaths from all causes were 12,193, and those from cholera were 543.

Ratnágiri.

37. On the 1st January the disease appeared in Kochare, a village in the peta Vengurla in the Málvan Táluka, and broke out at Chiplún and Dábhol, villages in the Chiplún and Dápoli tálukas. It then spread to a village in each of these two tálukas. In February it disappeared from the places previously affected, but appeared afresh in 9 villages of the Rajápur Táluka, and by the 5th in the town of Ratnágiri itself. From March it began to decline steadily, as it was only present in this month in 1 village of the Sangameshvar Táluka and in the town of Ratnágiri. The disease died out in April, but appeared for the first time in 2 villages of Devgad, and re-appeared in the Dápoli Táluka. A wedding party consisting of 25 members left Dapoli *en route* to Alíbág. The first case occurred among them at Alíbág, and a few days afterwards an old woman belonging to this party was attacked, and returned to Dápoli, where she died. In May it continued in Dápoli, and re-appeared in a village in the Chiplún Táluka. In June it left the whole district, except Phonde, a village in the Devgad Táluka, where the last case took place on the 23rd. The affected area included 6 out 8 tálukas, 1 out of 2 towns, and 21 out of 1,295 villages; and the population of this area is 65,116, that of the district being 997,090 : so their proportion to the greater number is 6·53 per cent. The attacks and deaths for the district during the year were 197 and 99 respectively, the percentage of the latter to the former was 50·25, and their ratio to the district population was 0·10 per mille. The deaths from all causes were 14,637, and those from cholera 99.

Kolába.

38. On the first day of the year the disease appeared in 3 villages of the Mahád Táluka, and prevailed for 10 days, when it spread to 3 other villages in the neighbourhood. At the latter end of January it appeared in Pen and Alíbág tálukas. In February it continued in the 3 tálukas just named, and appeared for the first time in the town of Alíbág on the 9th. From 23rd February to 21st August the district was free, but on this day it re-appeared in the town of Pen in the táluka of the same name and lasted till the end of the month. On the 3rd October it was reported from 3 villages of the táluka of Mángaon—the first case being a woman in the town of Mángaon. The disease disappeared on the 17th October in this town. The affected area included 4 out of 6 tálukas, 1 out of 2 towns, and 16 out of 973 villages; and the population of this area is 34,593, that of the district being 38,649 : so their proportion to the greater number was 9·07 per cent. The attacks and deaths for the district during the year were 223 and 149 respectively, the percentage of the latter to the former was 66·82, and their ratio to the district population was 0·39 per mille. The deaths from all causes were 7,277, and those from cholera 149.

Bombay City.

39. In the city of Bombay cholera was continued from the preceding year, as there were in December of that year 125 attacks and 91 deaths. In January of the year under report it prevailed from the beginning to the end of the month. After the middle of February the disease began to abate. Dr. Weir, the Health Officer, in his report for the first quarter thus speaks about this outbreak :—"The chief points of concentration of incidence were in Parel village, in Mugbhát, in buildings built around an open space called Pimpalvádi, and in Nacoda's cart, Girgaum ; in Parel village and in Pimpalvádi there was a strong presumption of connection between impure well water-supply and the concentration of cases; there were grounds for believing that the well water was a probable factor in both

instances. In the Parel village the well waters were supposed to be used only for washing and the cleansing of cooking utensils; they were, however, drunk; the water of one well in the centre of the village was very impure; the water of the second well near the Parel tank was suspicious, and exposed to contamination—under the ordinary circumstances the water might be used; the water of the first well in the centre of the village was contaminated from a privy; it was very impure, totally unfit for drinking; both wells were at once closed, the first well has been covered over; the water of the well near the tank is allowed to be used for washing. Parel village has no system of drainage; the drainage is either received into cesspools or runs into open channels which discharge into low-lying ground; one portion of drainage soaks into the ground of Government House compound, and is so disposed of." From February to May the disease gradually declined, and on the 4th May it disappeared. There was no cholera during the month of June, but on the 5th of July it re-appeared, and continued till the 20th October. No death took place in November, and in December there was only one fatal case, which occurred on the 18th of this month. The attacks and deaths for the city during the year were 245 and 190 respectively, the percentage of the latter to the former was 77·55, and their ratio to the total population was 0·25 per mille. The deaths from all causes were 20,229, and those from cholera were 190 only.

Table showing Cholera Mortality by Months, and the Means, for a period of 35 years.

Years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Years.
1846	...	11	7	17	10	9	6	2	2	...	5	...	69	1846
1849	...	...	1	4	1	...	...	121	690	269	160	682	2,128	1849
1850	...	141	53	269	697	296	259	324	348	149	51	53	2,867	1850
1851	...	1,273	900	1,512	805	373	329	77	87	25	19	20	267	1851
1852	...	408	91	160	271	149	151	165	66	19	10	6	24	1852
1853	...	23	9	4	5	18	9	6	6	8	250	671	349	1853
1854	...	754	399	373	794	520	950	317	68	14	11	9	5,507	1854
1855	...	60	22	28	302	585	273	167	53	75	46	21	20	1,645	1855
1856	...	134	209	541	338	260	197	50	23	19	28	40	147	1,562	1856
1857	...	459	185	306	403	249	302	157	96	32	21	18	13	2,181	1857
1858	...	15	2	8	15	11	9	5	9	11	6	4	7	102	1858
1859	...	9	10	9	7	69	845	209	170	41	85	131	262	1,965	1859
1860	...	289	222	206	221	165	107	89	139	51	47	29	9	1,961	1860
1861	...	15	9	8	7	16	15	10	15	34	30	25	466	1,961	1861
1862	...	695	540	359	366	267	258	117	66	261	272	201	269	3,179	1862
1863	...	99	59	90	161	155	161	413	240	179	105	178	319	2,399	1863
1864	...	622	401	302	695	837	395	271	301	223	85	137	421	4,847	1864
1865	...	262	140	122	350	624	266	136	63	31	33	22	13	2,067	1865
1866	...	15	15	13	18	21	15	27	63	53	49	21	27	337	1866
1867	...	11	21	12	20	5	9	5	7	6	4	...	111	1867
1868	...	1	...	...	3	3	2	4	6	11	43	69	103	227	1868
1869	...	157	93	97	91	82	61	54	47	60	26	3	3	754	1869
1870	...	4	3	5	3	7	13	4	13	76	41	64	93	326	1870
1871	...	69	41	27	24	15	10	5	11	13	29	6	4	255	1871
1872	...	1	5	4	7	6	7	46	54	32	11	5	11	190	1872
1873	...	23	12	17	15	8	7	5	1	5	3	2	2	99	1873
1874	...	1	...	2	3	7	...	2	1	2	2	...	...	19	1874
1875	...	1	1	...	21	67	132	279	168	43	53	28	21	834	1875
1876	...	1	...	2	4	5	9	119	143	64	22	6	...	374	1876
1877	...	1	61	111	195	287	704	495	337	189	42	21	64	2,510	1877
1878	...	20	199	231	129	197	99	156	125	43	52	60	35	1,348	1878
1879	...	37	10	15	4	39	14	93	74	64	41	10	4	403	1879
1880	...	8	6	2	2	5	2	7	1	7	7	1	1	50	1880
1881	...	...	...	9	66	85	111	73	48	35	9	91	20	547	1881
Means for 34 years.	...	168	112	126	165	162	164	121	89	71	60	65	118	1,436	Means for 34 years.
1882	...	60	68	17	5	1	...	13	12	5	2	...	1	180	1882.

Thána.

40. The disease appeared during the first week in January in the town of Thána, and in less than a fortnight it broke out in two neighbouring villages—Kúrla and Bhándup—in the Sálsette Táluka, and 7 villages in the vicinity of the Panvel town in the Panvel Táluka. Kúrla is situated just outside the island of Bombay, and is connected with only the G. I. P. Railway line. In it there are large cotton spinning mills where thousands of people are constantly at work.

Dr. Clarkson, the Deputy Sanitary Commissioner of the Konkan Division, was directed to visit the place at once and report. The local conditions and other particulars are detailed in his report, which is as follows:—

"The first case appeared in a chall, some distance north of the new Kúrla Spinning Mills, and the outbreak was chiefly confined to it, but 5 cases occurred in places not far from it. Sixteen people were attacked, and 11 died. Appendix A gives the names of the people attacked, the number of the room occupied by them in the chall, the date of attack, and the date of death. There is also a rough sketch of the ground plan of the chall, with the rooms numbered. The chall runs nearly north and south by the side of the main road, is about 120 feet long and 40 broad, and is divided into two by a wall running along its whole length. The slope of the ground is from east to west. On the east side the plinth of the

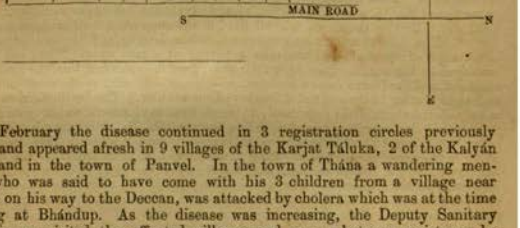
chall is a foot high, but the floor is almost level with the ground on its western aspect, and on this side also the roof comes down to nearly 3 feet from the ground. In the chall there are 19 rooms, of which 11 face the road, and 8 are behind. The rooms in front are fairly good, with a verandah and door in front (east side) and a window behind. In these rooms, as far as can be ascertained, 60 people were living. The rooms at the back are 8 in number, and the partitions are made by slight bamboo screens, so that air and smoke can easily pass from one to the other. There are no windows, the roof slopes down very low, the place is very dark, and one passage—not two paces broad—entered from the north side affords entrance and exit to all the occupants, who are stated to have numbered 25. The back windows of the front rooms open on this passage. It seems to me that this part of the chall was intended for cattle. There is a spare part of the chall at the south end (marked S. in the plan) which is used even now as a urinal, and along which bathing and cooking water from the first room flows. It was, I am informed, very dirty; and so, I dare say, were the rooms, until cleanliness was enforced by the Medical Officer, Kúrla. The well from which the inmates of the chall used to take their drinking water, is about a hundred yards to the west of the chall, and the slope of the ground is from the chall to the well. Cholera commenced by a man, named Bhau Náráyan, being attacked. He is stated to have gone to Bombay on January 6th, and to have put up somewhere near the police chauki in the neighbourhood of the Gokuldas Tejpal Hospital. Cholera has been in that neighbourhood, but of course it is impossible to know with any amount of probability that this man contracted it there. He returned to Kúrla on the 7th, was taken ill on the 9th, and died the same evening. This man lived in room No. 3. I shall refer to the other cases by the serial numbers placed against their names. On the 12th, Nos. 2, 3, 4, 5 and 6 were attacked. Nos. 2 and 3 are brothers, and live in room No. 18. No. 2 died on the 13th, and No. 3 on the 14th. No. 4 lives in room 5, and died on the 13th. Nos. 5 and 6 are relations, and live in room 17. No. 5 died on the 13th, and No. 6 recovered. On January 13th, Nos. 12, 13, 14 and 15 were attacked. No. 12 lives in room 12. No. 13 in room 13. Nos. 14 and 15 in room 14. They all recovered. After an interval of 10 days, on January 23rd, case No. 16 occurred. No. 16 is mother of No. 15, and related to No. 14, and lives in the same room with them. She died next day. Besides the above, who all lived in the same chall, 5 other cases occurred not far off. Nos. 8, 9, 10 and 11 are employed in cotton cleaning, and lived on the banks of the creek north of the chall, and less than a quarter of a mile away. There are 25 people employed on the works. They drew their water from the same well that the inmates of the chall did, and lived in two sets close together—one set somewhat to the north of the cotton mill and the other to the south of it, but have dispersed now. The dwelling-places consisted merely of sticks with cloths over them; 16 people lived to the north, and of these Nos. 8 and 9, who lived close together, were attacked on January 13th. No. 8 died next day, No. 9 on the same day. Nos. 10 and 11 lived more to the south with 9 others. They were brothers living in the same compartment. They were attacked on same day as Nos. 8 and 9 (viz. January 13th). No. 10 died the same day, and No. 11 on the 15th. No. 7 is a peon, and lived in a chall almost opposite the New Kúrla Spinning Mill and some little distance south of the chall first mentioned. No other case occurred, although there are a large number of people living there. This, then, is the progress and extent of the cholera. As regards the causes, I am unable to state positively how it was introduced, although it seems as if it was brought from Bombay by No. 1, Bhau Náráyan. As regards its spread, I am of opinion that it was by infection; the poison being carried to rooms 17 and 18, just behind room No. 3, and here it was favoured by the bad ventilation of the place and the easy communication that there is between the rooms. It will be seen that out of the 11 cases which occurred in the chall, 9 took place in the back row. The same cause explains its appearance outside the chall, for those men employed in cotton cleaning used to come for water to the well to the west of the chall, and had to pass close to the chall to get there, and no doubt communicated with the inhabitants of the chall. The case of No. 7, Ganu Sambhaji, is noticeable as being an isolated case as it were occurring in a chall some distance away. It may be said that the water of the well had something to do with the outbreak; but although drinking impure water predisposes to disease, I do not think that the cause of the cholera was in the well water; for, if it had been, the outbreak would have been of a much more extensive nature."

APPENDIX A.

Number.	Names.	Number of Room in Chall.	Date of Attack. January.	Date of Death. January.	Remarks.
1	Bhau Náráyan	3	9	9	
2	Raghu Bapa Shet... ...	18	12	13	Relations living in the same room.
3	Rama		12	14	
4	Tana Raghu Sindhay ...	5	12	13	
5	Dhondu	17	12	13	Do. do.
6	Luxuman Dhondu... ...		12	R.	

Number.	Names.	Number of Room in Chall.	Date of Attack. January.	Date of Death. January.	Remarks.
7	Gannoo Sambháji... ...	...	12	12	Peon living in another chall.
8	Dewji	...	13	14	Men employed on the cotton works, and living north of chall.
9	Raoji Ghatgay	...	13	13	
10	Govind Dowlat Sindhia ...	...	13	13	
11	Raoji Sakhárám	...	13	15	
12	Gannu Govind	12	13	R.	
13	Huri Joti Gosávi	13	13	R.	
14	Vithú Balu Silgoukar ...	14	13	R.	Relations living together.
15	Hira Vithoba	14	13	R.	
16	Jankibhái	14	23	24	

ROUGH PLAN OF CHALL.



In February the disease continued in 3 registration circles previously affected, and appeared afresh in 9 villages of the Karjat Táluka, 2 of the Kalyán Táluka, and in the town of Panvel. In the town of Thána a wandering mendicant, who was said to have come with his 3 children from a village near Bhándup on his way to the Deccan, was attacked by cholera which was at the time prevailing at Bhándup. As the disease was increasing, the Deputy Sanitary Commissioner visited the affected villages, and gave whatever assistance he could to the district officers. In March cholera still prevailed in all the affected circles, except the town of Thána, and attacked a new village in the Bhiwndi Táluka. From 1st April it began to decrease, as it was reported only from 2 affected tálukas and from the town of Thána. There was no cholera during the month of May. But on the 5th June it appeared for the first time in a village in the Murbád Táluka, and on the 14th and 19th it re-appeared in the Panvel and Karjat tálukas. In July it disappeared from the Murbád Táluka, continued in 2 tálukas just named, and re-appeared in the Sálsette Táluka. In August also it disappeared from the Sálsette Táluka, but re-appeared in the Bhiwndi Táluka and in the town of Thána. In September it was lingering in 3 villages—one in Panvel, Karjat and Sálsette tálukas respectively: the last case occurred on the 12th in the village of Kúrla. As soon as Dr. Clarkson heard of the revitalization of the disease at Kúrla he again visited the place on the 15th September, and thus reported the insanitary state of the village to the Collector of Thána:—"The village is dirty. It is not drained, and it would be difficult to do so properly. The dirty water and other stuff from the houses is discharged into the lanes." He then suggested that, "in the event of a death, the room itself should be fumigated by sulphur being burnt in it, with the doors and windows shut. The floors, if of earth, should be scraped, and the scrapings mixed with disinfectant and buried. The clothing of the patient should be boiled in water into which carbolic acid in due proportion has been put." The affected area included 6 out of 11 tálukas, 2 out of 3 towns and 53 out of 2,097 villages; and the population of this area is 81,751, that of the district being 908,548: so their proportion to the greater number is 9 per cent. The attacks and deaths for the district during the year were 1,123 and 774 repectively, the percentage

of the latter to the former was 68·92, and their ratio to the district population was 0·85 per 1,000. The deaths from all causes were 20,071, and those from cholera 774.

Surat.

41. The first appearance of the disease occurred in the Surat Zilla on the 28th January in Sultánpore's Borecfulia, a village of 1,137 inhabitants in the Jalálpore Táluka. February and March were the months of immunity, and on the 10th April a man is said to have died from it. It was absent till the 7th June, when it appeared in the town of Surat, where it lasted for 2 days. On the 21st of the same month another fatal case was reported from Ránder in the Chorási Táluka, and on the 6th July the last case occurred in the same place. The affected area included 2 out of 8 tálukas, 1 out of 2 towns, and only 2 out of 780 villages; and the population of this area is 120,397, that of the district being 614,198: so their proportion to the greater number is 19·60. The attacks and deaths for the district during the year were only 10 and 9 respectively, but the percentage was very high one of 90·, and their ratio to the district population was 0·01 per mille. Here the deaths from all causes were 14,007, and those from cholera 9 only.

Broach.

42. The whole district was almost free during the year, as only one fatal case took place in the Ambheta village of the Hánsot Táluka on the 26th September.

Kaira.

43. This district was free from cholera for the first half of the year; but on the 18th July it appeared in Kaira, the chief town of the district, and 5 days afterwards it broke out in another town of Kapadvanj. The disease was said to have been brought here from Kathal, a neighbouring village, and to Kathal from a village near Ahmedabad. A village in the Nadiád Táluka was next attacked, and afterwards it spread to 10 villages in the Kapadvanj Táluka, and 272 fresh cases and 138 deaths occurred in the 2 towns previously affected in August. In the town of Kapadvanj itself there were 188 attacks and 82 deaths, and the Collector and the Deputy Sanitary Commissioner at once proceeded to it and other affected localities. The report regarding this outbreak by Dr. Colah, the Deputy Sanitary Commissioner, Gujarát Registration District, is given below :—

Origin.

"1. The first case of cholera occurred on the 12th July. An old *patidár* woman, aged about 60, went to see a relative at Gogávada, a village of Nadiád Táluka distant 12 miles. This relative was taken ill with cholera and died. The *patidár* woman returned to her house in Kapadvanj, took ill immediately after, and died of cholera. Though the hospital assistant reported through the police patel that this woman died of cholera, yet the death was returned under fever. Through whose fault this false registration occurred, is under investigation. From information received it appears that about this time cholera existed in Gogávada of Nadiád Táluka and in Kathlal of Kapadvanj Táluka, villages situated on the opposite banks of the river Wurasi. In these villages the disease is said to have been imported by travellers from Ahmedabad, but it was not reported officially.

Extension.

"2. After the 12th July an interval of 10 days passed without the occurrence of any case. The Horwád of Kapadvanj is situated close to the *patidárvada*, and on the 23rd the first fatal case in Horwád occurred in a Boráh boy, 9 years old. There was no direct communication between the boy or his parent or any one else in his house and the house in *patidárvada* where the fatal case occurred. It was the month of Ramzan; and the boy, well during the day, felt somewhat depressed in the evening, broke his fast, was soon after ill with vomiting and purging, and died in a few hours. On the 24th a Boráh girl, aged 7, took ill and died similarly. This girl lived in quite a different street; her house was distant, and, from careful inquiries made, it appears certain there was no connection between this house and the house of the boy who died on the previous day. From the 23rd to the 31st, 13 cases and 4 deaths occurred. Of these 9 were Boráhs, 1 Mahomedan Kasái, 1 Mulek, 1 Modh-Bráhmin and 1 Kachhia—or 11 Mahomedans and 2 Hindus. The Modh-Bráhmin case (a female aged 30 years) recovered, and the Kachhia (a boy aged 9 years) died. The houses of both are situated close to the Horwád.

"3. Regarding the origin of the disease in the Horwád, careful inquiries were made. It was at one time believed that it was owing to the sale of bad meat. The Boráh boy who died on the 23rd was believed to have eaten some sausages of bad meat and died thereafter, but on proper investigation it appeared that the boy had not taken any meat food at all. Nor could the breaking out of the disease and its extension in Horwád be attributed to bad food of any kind or to the use of any impure water. The sanitary condition of Horwád at this time was as under:—A densely populated area with narrow streets and tall houses of two or more stories, containing within it about 500 deep well privies and 100 drinking wells, most of which are in close proximity to the deep well-privies. As it was the monsoon season, the *moris* of all houses were allowed to run out, and thus the streets contained in the centre more or less stagnant open drains of filthy matter. To this may be added the usual filthy collections of surface refuse; such was the sanitary condition of the Horwád. The Ramzan month commenced on the 16th July, when the Mahomedans, as a class, take their meals at 6 P. M. and 2 A. M., and observe a strict fast during the remaining hours, so that the people living in the Horwád had already undergone a week's fasting. The theory, which with some diffidence I venture to put forth, is this. The morbific material of this disease having been brought by the *patidár* woman, found some appropriate nutrient matter in the atmosphere of Kapadvanj, and having in 10 days' time sufficiently reproduced itself and impregnated the atmosphere, the disease declared itself among the Boráhs, who were living in certain insanitary conditions, who had undergone a week's fasting, and, consequently, whose powers of resistance to the invasion of the disease must have greatly diminished.

Theory as to the origin of the disease.

"4. The subsequent course of the disease was as follows. During August 11 more cases occurred in the Horwád. But from the early part of August the disease appeared in Kasáivád and Ghanchivád, situated at a long distance from the Horwád; the latter is in the south-east corner of the town, whereas the Ghanchivád and Kasáivád are at the north or north-west end of the town. The Kasáis and Ghanchis have much business connection with the Boráhs; some of the Kasáis work as day servants in Boráh families. Intercommunication between these people was free, and up to the end of August, 81 cases occurred among these people and other classes of Mahomedans living in their neighbourhood. Thus, for the first fortnight after its appearance, the disease mainly prevailed among the Mahomedans; solitary cases occurred now and then among Hindus (Kachhiás, Bhowsáris, &c.,) living in the neighbourhood of the Mahomedan quarter. From the 12th August the disease extended amongst the Hindus of all classes, the Bhowsáris and Vániás suffering most from it. From the commencement of the epidemic up to the close of August, 201 cases and 85 deaths occurred; this gives a death-rate of 42·58 per cent. of those affected.

Subsequent course of the disease.

"5. When from the 23rd July a succession of cases and deaths occurred, the Hospital Assistant brought the fact to the notice of Ráo Sáheb the Mámlatdár, who is also *ex-officio* chairman of the town municipality. On the 8th August, when I learnt of the breaking out of the disease, I advised that the following measures may be efficiently carried out:—

Sanitary measures taken.

1. Removal of surface refuse and any other filth from every part of the town, outside it, and its burning.

2. Covering of existing manure heaps or pits with dry fresh earth 3 or 4 inches deep.

3. Keeping the precincts of all drinking wells dry and clean, and the prohibition of cloths washing and cleaning of cooking pots and other utensils on or near drinking wells.

4.* The scrupulous disinfection of affected houses by sulphur fumigations.

5.* The scrupulous collection of cholera discharges, their thorough disinfection, and burial outside the town.

6.* Burning of all clothing soiled by cholera discharges.

7.* Clothing of some value, soiled by cholera discharges, not to be permitted to be washed on a drinking well or in the river or in back yards of houses, but to be carried out of the town and washed at a distant place.

8.* Sulphur fumigation of public streets where cholera may be most prevalent.

9.* In houses, where a succession of cases occur, the occupants may be advised to vacate and to occupy some other dwelling temporarily; in the meantime the roofing and other parts of the house be removed, and the house so opened up on all sides as to let in full sun-light and open air.

10. During the prevalence of the epidemic great caution ought to be observed in the use of food and drinking water. All indigestible articles of food ought to be avoided, and the sale of unripe or rotten fruit, rotten fish and bad meat be strictly prohibited.

11. All caste dinners to be put a stop to during the prevalence of the disease.

Note.—All the above measures are to be rigorously carried out, and specially those that are marked thus*.

"6. On the 11th August a large number of cases (17) occurred; and the report of this reaching Kaira, Mr. Bahmunji Edulji Mody, the District Deputy Collector in charge of the táluka, was sent to Kapadvanj, where he arrived on the 14th. Mr. Grant, the Collector, followed him, and arrived on the 18th; and having been asked by Mr. Grant to meet him there, I myself reached Kapadvanj on the morning of the 21st. From inquiries made after my arrival, I learnt that there was at first some disposition on the part of the Ráo Sáheb the Mámlatdár to think lightly of the disease; but when a succession of cases occurred day after day, he took pains to enforce general cleanliness and attended to some other measures. It is certain, however, that up to the 14th no very active steps were taken. Mr. Bahmunji's arrival was, therefore, of great importance. He lost no time in getting the town thoroughly cleaned, all the manure heaps in and out of the town were covered in with dry earth, surface refuse and all rank vegetation were most efficiently got out of the town, the precincts of all drinking wells were cleaned, and special measures were organized to carry out the other important sanitary recommendations. The use of one drinking well, which was suspected to be infected by cholera discharges, was stopped. No labor was spared, and everything was being done most scrupulously as far as the willing co-operation of the people could enable the authorities to do. In addition to what was recommended by me, Mr. Grant of his own accord took the most praiseworthy step of ordering the removal of all cattle from inside the town to appropriate encampments outside it. This was a sanitary measure of no little importance. It would have been impossible to keep the town clean without taking such a step. Another important sanitary measure, the proposal of carrying out which also emanated from Mr. Grant, was the segregation of all cholera cases. A suitable open site was selected at some distance outside the town, and it was proposed to erect temporary sheds and remove all cholera cases here for treatment and management. There can be no doubt that this was a most important measure, not only for the town people generally, but also for those taken ill with the disease; for removal of the cases from the small, dirty, ill-ventilated rooms in which they were lying surrounded by insanitary conditions would have been a half cure. But in determining upon the advisability of enforcing such a measure other considerations prevailed. Judging of the social habits of the people and their varied prejudices, religious and otherwise, it was clear that the people of their own accord would not willingly undergo this segregation, and any attempt at enforcing such a measure would lead to evil consequences. Illness from cholera would be screened, the people would not apply for medical relief, and the carrying out of three important sanitary measures—*viz.*, (1) removal of cholera dis-

charges, (2) burning of soiled clothing, and (3) disinfection of houses—would be frustrated. Deaths would be passed off under any other disease than cholera. By taking such a step against the will of the people there was thus a great risk of undoing all the good that was already done. It was, therefore, considered prudent not to enforce segregation. A cholera shed was erected, and it became useful for the treatment of under-trial prisoners and other poor houseless persons."

(Signed) M. B. COLAH, M.D.,
Deputy Sanitary Commissioner, E. G. R. D.

In September the disease showed a steady and gradual decrease; it was present in 2 tálukás (Kapadvanj and Nadiád) and in the town of Kapadvanj, but appeared anew in only one village of the Mehmadabad Táluka. The Collector stated that "on the 11th of this month there was a very violent storm of wind with rain and some thunder and lightning. A large number of trees were blown down." There was a marked decrease in the number of cases after this storm. As the disease was principally confined to one quarter of the town of Kapadvanj, the water-supply was examined. The Collector further remarks that "this town is perhaps the cleanest town in the district." As regards Dr. Colah's remarks on the Boráhs' quarter, the Collector says: "It was not in it that the disease chiefly raged, and the khalkuwa question is a very difficult one to deal with. The fact is, no municipal town has sufficient funds to carry out so expensive a measure as a complete system of drainage, and the choice seems to lie between khalkuwas and allowing filthy water to stream along the street from every house, which must be prejudicial to health, unless the rain be sufficiently heavy to carry it off, as is only the case for a few weeks in each year." "The people, left to themselves, are quite indifferent as to sanitary measures, and with few exceptions will take no medicines of their own accord. Offerings to the cholera goddess by the Hindus and feasts to fakirs by the Musalmáns were the means probably resorted to for stamping out the disease. Finally, an astute Bráhmin, just when the disease was dying out at Kapadvanj, announced that if 4 lamps were lit at a particular gate, and a temple promised by the Náwás to the goddess, the epidemic would cease. His advice was followed, and the cholera disappearing, the temple is to be erected." In October the disease continued in the Mehmadabad Táluka, disappeared from the town of Kapadvanj, but re-appeared in the town of Kaira, and appeared for the first time in a small village of Káloli situated at a distance of 10 miles from the town of Kaira. Here a woman on her way from Tundel, where there had been no cholera, was seized at the crossing of the river Matrak, not far from Káloli, to which village she proceeded. She recovered, but cases occurred daily after her arrival, and a large number of deaths took place. It is stated that the disease did not come from the Kapadvanj direction, but from the south-east or west. The disease declined after the 14th, though it did not quite cease until the cold weather set in. On the 30th October the last case was recorded in Sarasvani, a village in the Mehmadabad Táluka. The affected area included 4 out of 7 tálukas, 2 out of 4 towns, and 20 out of 577 villages; and the population of this area is 76,120, that of the district being 804,800: so their proportion to the greater number is 9·46 per cent. The attacks and deaths for the district during the year were 505 and 268 respectively, the percentage of the latter to the former was 53·07, and their ratio to the district population was 0·33 per mille. The deaths from all causes were 17,970, and those from cholera were 268.

Ahmedabad.

44. The Ahmedabad Collectorate was free for the first 4 months of the year, but on the 4th May a sudden outbreak was reported from 2 villages in the Viramgám Táluka, and during the month it spread rapidly to 12 villages in the same táluka. In the middle of the month it reached the town of Viramgám, and in the latter end of it was present in the Dhuliá, Sánand, Paránti and Dholka tálukas. At Sánand the disease is said to have been brought by a traveller from Viramgám. In Viramgám Táluka there were 288 attacks and 147 deaths, and the remaining (38 attacks and 15 deaths) took place in the other localities. According to the report of the Mámlatdár of Viramgám the origin of the disease is thus accounted for:—"A marriage party left a village in the Viramgám Táluka and went to

Vanod, a village under Rájkot in Káthiáwár; but owing to an outbreak of cholera there the party (some of them seized with cholera) dispersed, and left for their respective villages. Some of them died after arrival in their villages." In June the disease invaded the whole collectorate, except the Gogha Táluka. It broke out in 41 fresh villages during the month. From July it decreased rapidly. It was continued in 5 tálukas and in one town previously affected. In August it was confined to a village in the Viramgám Táluka and the town of Ahmedabad only. On the 15th September one woman was affected in the town of Ahmedabad, who recovered. On the 4th October it re-appeared in 3 villages in the Dhandhuka Táluka, *viz.*, Rámpur—close to the railway station of the same name on the Bhávnagar-Gondal State Railway, Alampur, and Bubavas, a village about 5 miles to the south of Rámpur. Here the disease is said to have been brought from some of the neighbouring villages of Káthiáwár. On the 15th November a fatal case was reported from the town of Ahmedabad which was the last for the year. The affected area included 6 out of 7 tálukas, 3 out of 4 towns, and 64 out of 857 villages; and the population of this area is 268,759, that of the district being 856,324: so their proportion to the greater number is 31·39 per cent. The attacks and deaths for the district during the year were 1,329 and 689 respectively, the percentage of the latter to the former was 51·84, and their ratio to the district population was 0·80 per mille. The deaths from all causes were 20,724, and those from cholera were 689.

Thar and Párkar.

45. The Sind District was free from cholera during the year, except that 4 attacks and 3 deaths took place in the Nagar Párkar Táluka. The origin of the disease is thus given by the Deputy Commissioner, Thar and Párkar:—"One of the party of 12 persons arriving at Adhigaon, in the Nagar and Párkar Táluka, from Bhela, a place in Cutch territory distant 48 miles from the former, was seized with cholera on the 27th May, and died on the 28th within 24 hours from the time of seizure." Three other persons at the same time were attacked, but 2 only have succumbed.

Mortality in Rural Circles or Tálukas.

46. The details for each affected táluka in different districts are given in the statement appended to the cholera map, but a few may be selected here to show how the results compare with those of other tálukas. Ninety-eight out of 323 rural circles or tálukas were more or less affected by cholera during the year. The subjoined table shows in order of precedence those rural circles or tálukas (5 in all) in which the deaths from cholera exceeded 3 per 1,000 of population. It will be seen from this table that the disease was, for the most part, confined to 2 tálukas of Khándesh and 1 each in those of the Belgaum, Thána and Ahmedabad districts. The last column of this table shows the position of the táluka in the cholera map. Heading the list is the Valva Táluka in the Sátára Collectorate, where the ratio of deaths per 1,000 of population was 5·57.

No. in sequence.	Names of Tálukas or Rural Circles.	Name of District.	Population by Census of 1881.	Deaths from Cholera.		Corresponding Number in Map.
				Number.	Ratio per 1,000 of Population.	
1	Valva	Sátára	169,408	944	5·57	53
2	Panvel	Thána	90,830	321	3·53	102
3	Khánápur	Sátára	80,327	258	3·21	55
4	Viramgám	Ahmedabad ...	117,584	374	3·18	119
5	Chikodi	Belgaum ...	245,614	758	3·09	64

Mortality in Towns.

47. Out of 55 town circles, 24 were affected during the year. The collective population of the affected towns was 1,451,067, and the deaths in them were 1,033; that is, one death occurred out of every 1,405 living. The details of these towns are all shown in the statement appended to the cholera map; but in the following table there are shown 4 towns in which the death-rate exceeded 3 per 1,000. Of these 4, one is in the Sholápur Collectorate, one in the Belgaum Collectorate, one in the

Kaira Collectorate, and one in the Ahmedabad Collectorate. The town of Gokák, in the Belgaum District heads the list, and the death-rate per 1,000 of population recorded was 15·81.

No. in sequence.	Name of Town.	Name of District.	Population by Census of 1881.	Deaths from Cholera.		Corresponding Number in Cholera Map.
				Number.	Ratio per 1,000 of Population.	
1	Gokák	Belgaum ...	10,307	163	15·81	68
2	Kápadvanj	Kaira	14,442	139	9·62	115
3	Pandharpur	Sholápur ...	16,910	57	3·31	48
4	Viramgám	Ahmedabad ...	18,290	59	3·11	123

Mortality in Civil Cantonments.

48. There are 7 civil cantonments in the Presidency, of which 3 only were affected during the year, namely, one in the Poona Collectorate, the other in the Ahmednagar Collectorate, and the third in the Belgaum Collectorate. The collective population was 51,657, and the deaths in them were 20, which equals one death in every 2,583 living.

Mortality in Villages.

49. The affected area included 804 out of 24,535 villages in the Presidency. The larger number of villages affected during the year was 236 out of 1,340 in the Satara District, and 96 out of 1,073 in the Belgaum District; in the remaining 16 districts the number of villages affected in each was below 65. The table subjoined shows the number of villages affected by cholera together with their population, month by month, in each district, and the last column shows the percentage of the affected villages to total villages:—

Districts.	Total Number of Villages.	Number and Population of Villages affected by Cholera in each Month of the Year 1882.																		Percentage of Affected Villages to Total Villages.
		January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.		
		Number.	Population.	Number.	Population.	Number.	Population.	Number.	Population.	Number.	Population.	Number.	Population.	Number.	Population.	Number.	Population.	Number.	Population.	Number.	Population.	Number.	Population.	Number.	Population.	Number.	Population.	
Khándesh	2,670	3	1,322	..	..	..	..	..	..	..	..	..	..	2	6,200	16	6,130	6	6,971	3	3,221	..	..	..	..	31	23,370	0·77
Násik	1,620	..	..	..	..	..	..	..	..	..	..	..	..	3	6,900	28	20,450	24	21,849	6	6,005	1	671	..	..	65	54,412	3·97
Ahmednagar	1,616	1	363	..	..	..	..	..	..	1	1,198	7	8,443	12	6,581	8	5,805	4	4,342	1	964	..	..	35	28,576	2·16
Poona ...	1,781	..	..	..	..	1	408	4	3,962	3	11,206	1	304	4	2,009	3	4,895	6	3,805	7	7,903	..	..	25	35,874	2·80
Sholápur ...	1,206	..	..	..	..	..	..	..	..	1	7,740	3	6,467	19	31,596	11	7,870	2	2,668	..	..	..	..	37	56,336	3·07
Satára ...	1,340	1	2,459	..	..	..	..	29	57,865	65	98,936	62	71,702	31	47,472	34	44,414	23	30,447	7	9,917	3	1,351	..	..	236	365,362	17·61
Belgaum ...	1,073	..	..	..	..	..	..	26	59,181	44	72,430	13	22,114	7	9,905	3	5,046	..	..	..	..	2	4,234	..	..	96	172,910	8·99
Dhárwar ...	1,091	..	..	..	..	..	..	..	..	1	765	2	1,630	..	..	..	..	4	2,256	..	..	12	6,710	6	7,135	24	18,496	2·21
Kánara ...	1,139	..	..	..	..	..	..	..	..	6	7,151	14	53,723	14	59,439	14	59,693	7	37,972	7	10,540	..	..	..	..	80	212,840	7·03
Khándesh ...	1,247	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Násik ...	1,205	6	20,892	1	2,770	1	402	3	6,174	2	7,345	1	2,860	..	..	..	..	..	..	..	..	..	..	..	..	21	82,899	1·65
Panchgani ...	327	3	15,840	1	7,344	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	1,337	..	..	..	10	24,521	1·83
Kolába ...	1,000	9	19,100	3	13,300	3	8,430	2	3,736	..	..	2	1,598	2	1,761	2	17,420	..	..	..	..	..	..	..	..	23	65,344	4·65
Thána ...	1,000	1	1,157	..	..	..	..	..	..	1	3,450	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	4,607	0·20
Surat ...	766	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	20,050	0·26
Broach ...	459	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	500	0·21
Kaira ...	977	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	21,137	7	23,670	2	4,234	..	..	..	..	20	49,041	2·05
Panch Mahlás ...	673	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ahmedabad ...	1,350	..	..	..	..	..	..	..	..	10	31,696	41	66,706	2	1,913	..	..	..	..	3	6,021	..	..	..	..	56	106,336	7·47
Karáchi ...	796	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Hyderabad ...	1,046	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Thar and Párkar ...	775	..	..	..	..	..	..	..	..	2	904	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	904	0·17
Shikárpur ...	1,377	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Upper Sind ...	143	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total ...	24,535	29	60,303	11	23,414	10	3,240	109	230,918	149	381,756	124	256,570	98	193,664	134	177,213	102	196,427	45	57,440	37	16,906	6	7,135	804	1,361,376	3·28

Attacks and Deaths.

50. The following table shows for each district the relation of attacks to deaths month by month, and the last column gives the percentages of deaths to attacks. It will be seen that there are 10 districts in which the percentage is above the mean, and in the rest it is below the mean. The mean percentage for the Presidency is 47·40:—

Division.		Districts.	Population by Census of 1881.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.		Percentage of Deaths to Attacks.
				Attacks.	Deaths.	Attacks.	Deaths.	Attacks.	Deaths.	Attacks.	Deaths.	Attacks.	Deaths.	Attacks.	Deaths.	Attacks.	Deaths.	Attacks.	Deaths.	Attacks.	Deaths.	Attacks.	Deaths.	Attacks.	Deaths.	Attacks.	Deaths.	Attacks.	Deaths.		
Northern Deccan.	1	Khándesh	1,237,231	30	17	..	..	..	..	..	..	..	..	..	..	..	..	195	86	35	17	20	20	..	..	..	..	311	135	43·41
	2	Nasik	761,256	..	..	..	..	..	..	..	..	..	..	..	..	90	15	211	96	228	149	90	26	20	4	..	..	817	301	36·84
	3	Ahmednagar	731,220	15	7	..	..	..	..	..	..	48	16	129	40	129	60	129	60	25	21	63	23	22	6	..	..	450	182	40·40
	4	Poona	600,621	..	..	..	..	14	6	43	16	58	24	14	8	32	15	94	45	82	43	90	37	6	5	51	12	464	211	45·48
	5	Sholápur	582,487	..	..	..	..	..	..	..	..	16	4	33	19	378	161	202	223	114	54	20	10	..	..	..	..	1,000	480	43·70
Southern Deccan.	6	Sátára	1,002,320	26	11	..	..	..	..	916	424	1,924	787	743	316	706	323	848	255	468	187	200	90	28	13	8	..	5,561	2,406	43·26
	7	Belgaum	954,014	..	..	..	..	..	..	535	241	1,680	805	308	157	241	82	59	20	9	7	14	5	21	16	1	1	2,867	1,334	46·86
	8	Dhárwár	887,907	..	..	..	..	..	..	..	..	20	7	2	2	..	..	..	..	2	6	..	..	194	99	49	26	272	130	47·79
	9	Kaládgi	839,402	..	..	..	..	..	..	..	..	69	33	306	163	242	119	294	124	51	35	174	67	19	11	2	1	1,318	543	44·58
Konkan.	10	Kánara	451,540	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	11	Ratnágiri	987,699	45	22	82	29	34	16	18	7	14	9	10	6	..	..	..	..	..	..	..	..	..	..	..	..	197	99	50·25
	12	Kolába	361,649	20	24	104	60	..	..	..	..	..	..	..	..	..	..	7	3	..	..	13	12	..	..	..	..	223	149	66·82
	13	Bombay City	773,196	86	60	66	34	28	17	11	5	3	1	..	..	13	12	18	12	10	8	2	2	..	..	1	1	235	190	77·55
	14	Thána	906,548	127	69	304	130	262	212	106	60	..	..	49	34	101	70	143	95	11	8	..	..	..	..	..	..	1,123	778	69·92
Gujarat.	15	Surat	614,796	2	2	..	..	..	..	2	1	..	..	5	5	1	1	..	..	..	..	..	..	..	..	..	..	10	9	90·00
	16	Broach	326,900	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	..	..	1	1	100·00
	17	Kaira	904,866	..	..	..	..	..	..	..	..	..	..	..	..	15	6	222	138	156	92	69	32	..	..	..	..	462	268	58·07
	18	Panch Mahals	253,479	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	19	Ahmedabad	856,324	..	..	..	..	..	..	..	..	326	162	835	444	160	67	46	9	1	..	46	17	2	2	..	..	1,329	689	51·84
Sind.	20	Karáchi	478,698	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	21	Hyderabad	754,624	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	22	Thar and Parkár	203,744	..	..	..	..	..	..	..	..	4	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	3	75·00
	23	Shikárpur	502,966	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	24	Upper Sind Frontier	134,181	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Total	16,464,414	434	272	456	267	418	311	1,675	754	4,114	1,836	3,413	1,179	3,040	999	2,593	1,156	1,305	612	814	362	322	149	113	41	16,676	7,904	
		Percentage of deaths to attacks		62·67		65·13		70·34		44·99		44·60		48·49		44·24		44·77		46·90		44·47		46·24		36·28		47·40			
		Percentage of cholera deaths to all deaths		3·92		1·69		1·19		2·98		6·43		4·97		3·41		2·99		2·13		1·22		0·44		0·13		2·20			

51. The statement appended to the cholera map shows the name of each district affected, the name and number of each circle, its population, the dates of first and last case, the total of cholera deaths, their ratio per 10,000 of population, the period of maximum intensity, the number of villages in each circle and the number affected and not affected:—

Statement appended to Cholera Map.

Statement appended to Map, illustrating the Distribution, &c., of Cholera in the Bombay Presidency during the year 1881.

1	2	3	4	5	6	7	8	9		10	11	
Districts.	Number of Circles as shown in the Map.	Name of Circle.	Population of Circle.	Date of First Case of Cholera in the Circle during the year.	Date of Last Case of Cholera in the Circle during the year.	Total Deaths from Cholera in the Circle during the year	Ratio per 10,000.	Period of Maximum Intensity of the Disease.		Number of Villages in each of the Rural Circles.	Number of Villages affected by Cholera.	Number of Villages not affected.
								From	To			
Khándesh	1	Dhulia .. R. C.	89,668	22nd August 1882.	29th August 1882.	4	0·67	August 1882.	August 1882.	152	2	150
	2	Sirpur .. "	100,001	10th " "	15th " "	15	1·76	September "	October "	197	3	194
	3	Shahpur .. "		13th " "	13th " "	12		August "	August "		1	
	4	Shirpur .. "	89,031	19th " "	23rd August "	4	0·67	"	"	132	2	130
	5	Pimpalner .. "	*97,549	1st January "	21st October "	29	2·91	October "	October "	256	3	253
	6	Chopda .. "	45,909	1st August "	25th August "	45	9·80	August "	August "	91	2	89
	7	Sindh .. "		30th " "	30th " "	2		"	"		1	
	8	Yaval .. "	1141,745	14th " "	20th " "	15	1·20	"	"	197	1	196
	9	Jámner .. "		1st October "	1st October "	1	0·12	October "	October "	20	1	19
	10	Dhulia .. T. C.	18,449	25th August "	25th August "	8	4·34	August "	August "			
Násik	11	Násik .. R. C.	70,138	15th July "	4th November "	26	5·23	September "	October "	135	9	126
	12	Sinnar .. "	86,091	2nd August "	18th October "	34	8·17	August "	September "	99	6	93
	13	Igatpuri .. "	68,749	14th July "	25th " "	11	1·60	October "	October "	198	2	196
	14	Niphád .. "	87,323	1st September "	7th " "	11	1·26	September "	September "	221	2	219
	15	Chándor .. "	50,609	29th August "	31st August "	3	0·59	August "	August "	108	1	107
	16	Yeola or Savargaon "	39,597	23rd " "	13th September "	14	3·53	"	"	137	1	136
	17	Nándgaon .. "	30,399	13th July "	15th November "	16	5·26	September "	September "	93	1	92
	18	Dindori .. "	64,573	3rd August "	27th October "	115	17·81	"	"	135	20	115
	19	Kalvan .. "	54,498	16th September "	16th September "	1	0·11	"	"	187	1	186
	20	Násik .. T. C.	32,706	24th July "	8th " "	36	13·35	August "	August "			
Ahmednagar	21	Jámkhed .. R. C.	69,960	20th August "	27th November "	15	2·46	October "	October "	73	5	68
	22	Pátner .. "	78,701	1st January "	19th September "	68	9·23	August "	August "	139	9	130
	23	Shevgaon .. "	83,291	4th July "	8th August "	89	9·05	August "	August "	91	6	85
	24	Karjat .. "	54,859	26th October "	11th November "	9	1·80	July "	July "	84	3	81
	25	Kopargaon .. "	82,799	11th September "	24th September "	6	0·84	October "	November "	79	2	77
	26	Rájuri .. "	69,200	15th " "	15th " "	2	0·31	September "	September "	141	1	140
	27	Shrigonda .. "	87,113	9th August "	23rd October "	24	2·90	"	"	111	2	109
	28	Ahmednagar .. Ca.	4,684	13th July "	13th July "	1	2·13	August "	August "	130	1	129
								July "	July "			
Poona	29	Junnar .. R. C.	81,800	9th August "	19th August "	6	0·69	August "	August "	193	1	192
	30	Indápur .. "	48,134	10th April "	29th July "	11	2·63	April "	May "	66	3	63
	31	Khed .. "	141,600	8th October "	21st October "	21	1·43	October "	October "	344	4	340
	32	Násik .. "	72,793	8th May "	31st October "	102	14·07	"	September "	204	15	189
	33	Purandhar .. "	75,676	17th March "	30th April "	12	1·69	March "	April "	92	2	90
	34	Shirúr Ghát .. "	119,439	2nd July "	31st December "	37	3·08	December "	December "	179	2	177
	35	Haveli .. "	150,959	6th " "	30th October "	8	0·53	September "	September "	277	1	276
	36	Mával .. "	62,583	1st April "	1st April "	1	0·16	April "	April "	764	1	763
	37	Poona City .. T. C.	99,822	13th May "	10th September "	11	1·10	July "	July "			
	38	Poona .. Ca.	197,381	1st September "	2nd October "	3	0·30	October "	October "			
Sholápur	39	Sholápur .. R. C.	69,906	27th June "	24th October "	42	4·67	July "	August "	148	7	141
	40	Bársi .. "	82,920	17th July "	30th September "	63	8·06	"	"	221	8	213
	41	Karmála .. "	87,961	23rd July "	18th August "	27	3·44	"	"	89	3	86
	42	Pandharpur .. "	55,302	30th May "	30th September "	57	8·05	August "	"			
	43	Mangola .. "	62,849	4th July "	"	"	"	July "	July "	123	10	113
	44	Mádha .. "	82,583	22nd June "	31st October "	96	11·62	June "	July "	54	4	50
	45	Malsiras .. "	56,326	14th July "	9th September "	18	3·20	June "	September "	76	16	60
	46	Sholápur .. T. C.	52,053	13th July "	24th August "	27	5·19	July "	July "	69	3	66
	47	Mohol .. "	56,178	10th " "	24th August "	27	14·06	August "	August "			
	48	Pandharpur .. "	35,959	8th " "	8th " "	57	15·85	"	"			
								"	"			
Satára	49	Sátára .. R. C.	90,985	10th April "	31st August "	164	18·04	May "	July "	147	26	121
	50	Jáoli .. "	60,481	12th May "	31st October "	80	13·23	"	May "	255	4	251
	51	Wái .. "	76,038	26th " "	31st " "	98	12·74	"	"	355	24	331
	52	Karád .. "	130,119	14th January "	"	250	19·56	"	June "	254	24	230
	53	Patan .. "	108,426	10th April "	"	204	18·77	July "	July "	103	24	79
	54	Tárgaon .. "	39,849	20th " "	19th September "	34	8·53	"	"	108	6	102
Satára	55	Khánapur .. "	60,751	8th May "	30th " "	232	38·11	April "	May "	236	9	227
	56	Khánapur .. "	70,757	8th " "	31st October "	153	21·62	"	"	98	6	92
	57	Mán .. "	82,117	26th " "	23rd " "	137	16·68	August "	September "	91	24	67
	58	Koregaon .. "	97,139	2nd November "	4th November "	66	6·79	"	October "	161	18	143
	59	Phúsa .. "	113,474	4th May "	19th October "	49	10·76	October "	November "	78	13	65
	60	Sátára .. T. C.	39,029	26th April "	19th August "	60	9·24	July "	August "	74	12	62
	61	Karád .. "	10,197	20th " "	20th " "	7	3·43	August "	"	205		
	62	Wái .. "	17,406	10th June "	15th " "	24	16·79	May "	May "			
					26th June "	10	6·89	June "	June "			
Belgaum	63	Belgaum .. R. C.	59,740	24th April "	"	"	"	"	"			
	64	Chikodi .. "	58,043	1st May "	1st December "	93	8·00	"	"			
	65	Gokák .. "	57,748	7th " "	31st October "	244	20·34	May "	May "	139	6	133
	66	Athni .. "	83,776	1st " "	31st " "	204	12·16	April "	April "	211	4	207
	67	Belgáum .. T. C.	29,315	24th " "	22nd October "	101	17·20	"	June "	119	23	96
	68	Gokák .. "	10,197	" "	13th November "	15	7·35	May "	July "	80	4	76
	69	Athni .. "	11,136	4th May "	15th " "	107	52·56	"	May "			
	70	Belgaum .. Ca.	9,262	22nd April "	14th September "	4	2·16	May "	"			
					13th May "	15	8·10	"	"			
Khándesh	71	Nandgaon .. R. C.	87,832	22nd September "	"	"	"	"	"			
	72	Malegaon .. "		17th " "	17th December "	81	9·78	"	"			
	73	Godag .. "	182,322	3rd " "	3rd " "	1	0·05	November "	November "	80	10	70
	74	Gadag .. "	80,774	21st November "	21st December "	8	1·00	"	December "			
	75	Karajgi .. "	93,218	25th May "	4th " "	14	1·50	October "	"	89	3	86
					25th June "	3	0·32	November "	November "	89	3	86
								May "	May "	120		
Kánara	76	Indi .. R. C.	71,940	4th June "	"	"	"	"	"			
	77	Muddebihál .. "	69,795	4th " "	30th August "	189	14·26	"	"			
	78	Sindgi .. "	72,600	9th July "	7th September "	2	0·14	June "	June "	121	3	118
					24th " "	97	6·13	August "	September "	146		
								July "	August "	141		

RUN OF CUTCH
GULF OF CUTCH
GULF OF CAMBAY
PALANPUR
KAIRA
BARODA
JUNAGARH

SKETCH MAP

TO ILLUSTRATE THE

DISTRIBUTION OF, AND COMPARATIVE MORTALITY

from

CHOLERA

in the

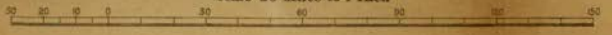
DIFFERENT CIRCLES OF MORTUARY REGISTRATION

OF THE PRESIDENCY OF BOMBAY

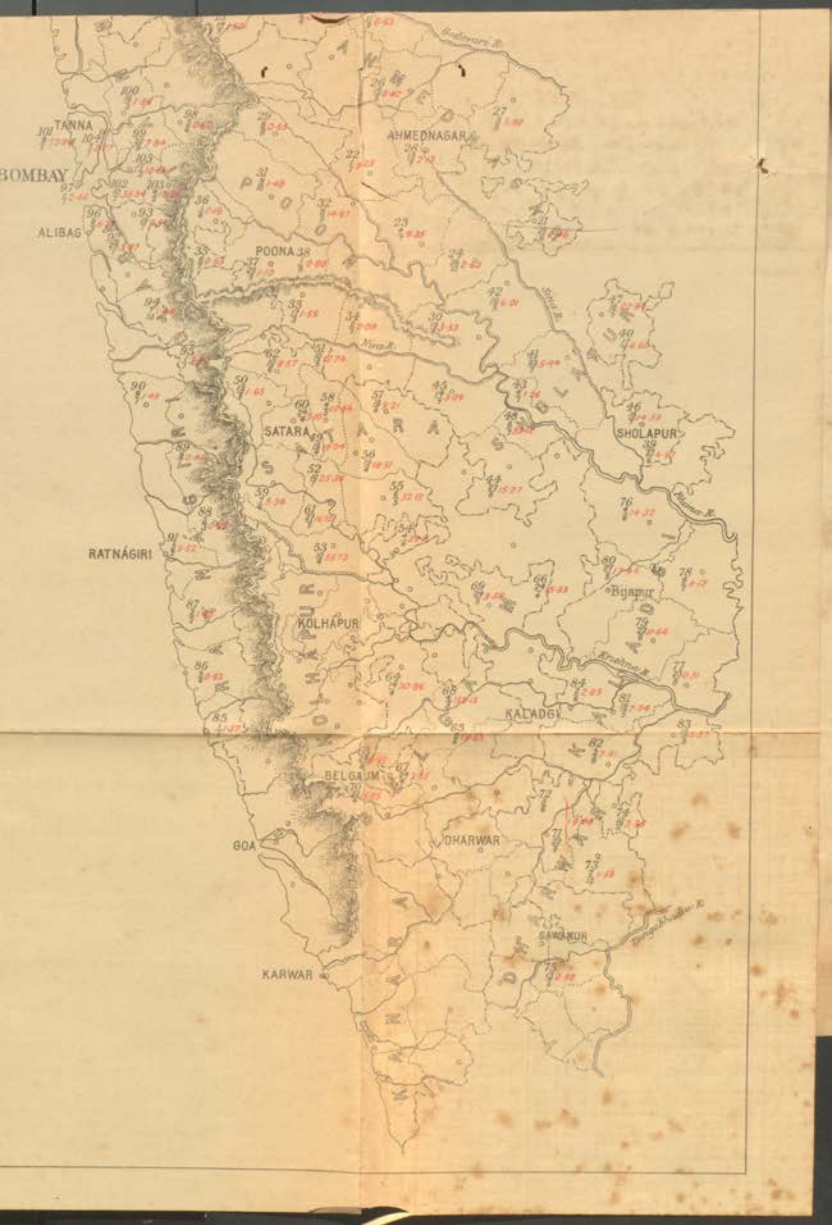
During the Year

1882

Scale 30 Miles to 1 Inch



N.B. Figures in black ink shew the Number of the Registration Circle. These Numbers are given in Column 3 of the "Statement appended to Map."
Figures in red ink shew the ratio of deaths from Cholera per 10,000 of population.
The fractional figures indicate the date of first cases in each circle. Thus $\frac{2}{7}$ means 2nd July.


TANNA
BOMBAY
ALIBAG
POONA
AHMEDNAGAR
SATARA
SHOLAPUR
RATNÁGIRI
KOLHÁPUR
Bijapur
KALADGI
BELGAUM
GOA
DHARWAR
KARWAR
Godavari R.
Bhima R.
Krishna R.

1	2	3	4	5	6	7	8	9		10	11	
								Period of Maximum Intensity of the Disease.			Number of Villages in each of the Rural Circles	Number of Deaths
Districts.	Number of Circles as shown in the Map.	Name of Circle.	Population of Circle.	Date of First Case of Cholera in the Circle during the year.	Date of Last Case of Cholera in the Circle during the year.	Total Deaths from Cholera in the Circle during the year.	Ratio per 10,000.	From	To		Affected by Cholera.	Not affected by Cholera.
Kaira—continued.	79	Bâjeswâli .. R.C.	88,743	22nd June 1882.	9th November 1882	191	11·64	June 1882.	August 1882.	120	21	104
	80	Bâjâpur .. „	76,986	27th May „	30th „ „	138	17·94	„ „	June „	93	19	74
	81	Bagalkot .. „	82,132	12th „ „	4th „ „	69	1·74	May „	„ „	102	35	102
	82	Bâsâwal .. „	80,047	5th August „	30th December „	99	7·41	August „	October „	105	7	138
	83	Hungund .. „	80,027	18th September „	1st October „	3	0·37	September „	September „	100	1	139
	84	Kaládgi .. T.C.	7,624	2nd June „	8th June „	1	1·35	June „	„ „	..	..	..
Satára	85	Mîrwan .. .. R.C.	109,923	1st January „	16th January „	15	1·37	January „	January „	67	3	6
	86	Dewgad .. .. „	117,809	5th April „	23rd June „	11	0·93	June „	June „	121	5	116
	87	Râjâpur .. .. „	127,309	3rd February „	3rd February „	23	1·80	February „	February „	171	7	167
	88	Sangameshwar .. „	104,880	3rd March „	13th March „	10	0·95	March „	March „	179	1	179
	89	Chipûn .. .. „	108,923	9th January „	22nd May „	7	0·41	May „	May „	219	2	219
	90	Dâpoli .. .. „	141,612	9th „ „	10th „ „	21	1·49	January „	January „	247	6	241
	91	Satára .. .. T.C.	15,456	9th February „	18th March „	12	9·32	February „	March „	..	..	..
Kolâba	92	Alîbâg .. .. R.C.	69,782	25th January „	13th February „	27	3·87	February „	February „	171	4	167
	93	Pen .. .. „	70,200	19th „ „	31st August „	67	9·54	„ „	March „	222	3	220
	94	Mangaon .. .. „	81,885	7th October „	17th October „	12	1·46	October „	October „	225	3	222
	95	Mahâd .. .. „	103,287	1st January „	„ „	39	3·80	January „	January „	245	6	239
	96	Alîbâg .. .. T.C.	6,376	9th February „	13th February „	4	6·27	February „	February „	..	..	..
Bombay City	97	Bombay City .. T.C.	773,196	1st January „	18th December „	190	2·46	January „	January „	..	..	..
Thâna	98	Murbâd .. .. R.C.	63,934	5th June „	10th June „	4	0·62	June „	June „	171	1	170
	99	Kalyan .. .. „	60,078	22nd February „	31st August „	61	7·04	March „	March „	222	3	219
	100	Shâhpûri .. .. „	79,962	16th March „	28th August „	14	1·96	„ „	„ „	194	2	192
	101	Silhetta .. .. „	98,490	9th January „	12th September „	214	12·94	„ „	„ „	112	3	107
	101	Panwel .. .. „	90,859	10th „ „	5th „ „	221	15·54	February „	„ „	118	12	106
	103	Karjat .. .. „	82,962	4th February „	1st „ „	155	12·88	July „	July „	208	19	189
	104	Thâna .. .. T.C.	14,456	7th January „	11th August „	4	2·77	January „	February „	..	..	..
	105	Panvel .. .. „	10,351	1st February „	14th March „	11	10·63	February „	„ „	..	..	..
Surat	106	Chorâsi .. .. R.C.	84,764	20th June „	6th July „	2	0·45	June „	July „	66	1	65
	107	Jalâlpur .. .. „	84,766	29th January „	29th January „	2	0·27	January „	January „	91	1	90
	108	Surat .. .. T.C.	109,844	7th April „	9th June „	5	0·46	June „	June „	..	..	..
Broach	109	Hânsot .. .. R.C.	¶65,054	30th September „	30th September „	1	0·15	September „	September „	99	1	98
Kaira	110	Mahmudabad .. R.C.	76,296	24th „ „	30th October „	8	1·05	„ „	„ „	59	3	57
	111	Nadiâd .. .. „	129,952	26th August „	23rd September „	9	0·69	„ „	„ „	91	4	87
	112	Kapadvanj .. .. „	78,982	14th „ „	25th „ „	77	9·80	August „	August „	85	12	73
	113	Mehar .. .. „	78,779	4th October „	14th October „	29	3·70	October „	October „	42	3	39
	114	Kaira .. .. T.C.	12,640	19th July „	7th „ „	7	5·54	August „	August „	..	..	..
	115	Kapadvanj .. .. „	14,447	23rd „ „	29th September „	139	96·25	... „	„ „	..	..	..
Ahmedabad	116	Daskroi .. .. R.C.	143,943	23rd May „	9th July „	43	2·99	June „	June „	137	6	131
	117	Dhandhuka .. „	123,197	11th June „	2nd November „	41	3·33	... „	„ „	141	5	136
	118	Sânand .. .. „	76,364	27th May „	19th July „	10	1·30	... „	„ „	93	3	90
	119	Viramgâm .. .. „	117,584	4th „ „	18th August „	324	27·51	May „	„ „	155	23	132
	120	Farkâdi .. .. „	107,504	29th „ „	2nd July „	17	1·58	June „	„ „	261	10	251
	121	Dholka .. .. „	99,476	23rd „ „	30th June „	3	0·31	May „	„ „	317	2	315
	122	Ahmedabad .. T.C.	122,820	4th June „	14th November „	113	9·36	June „	„ „	..	..	..
	123	Viramgâm .. .. „	15,060	15th May „	30th June „	39	31·07	... „	„ „	..	..	..
	124	Dholka .. .. „	17,716	26th June „	30th July „	26	15·80	July „	July „	..	..	..
Thar and Parkar District	125	Nagar .. .. R.C.	37,512	27th May „	28th May „	2	0·80	May „	May „	..	2	..

N.B.—As the population for the undermentioned places cannot be obtained for each, the ratios are calculated on the grouped populations as shown :—

* { Pimpalner .. R.C. / Nimkopar .. „ } 87,549

† { Sâvda .. .. R.C. / Yâval .. .. „ / Ukhâni .. .. „ } 141,745

‡ { Poona .. C.T. / Kirkee .. „ } 37,381

§ { Gadag .. R.C. / Mundargi Patta .. „ } 83,236

‖ Pen .. .. R.C. } 70,200 / Nagotna .. .. „ }

¶ Anklesvar .. .. R.C. / Hansot .. .. „ } 67,053

52. The cholera map itself illustrates the distribution of, and mortality from, cholera in the different registration circles in which the disease was more or less prevalent.

Cholera Map.

SMALL-POX.

53. In 1882 the registered deaths from small-pox were 1,630; and, shown by sexes, they were 791 of males and 839 of females against 539 in 1881, which shows an increase of 1,091, and compared with the mean for 9 years (from 1872 to 1880) there is a decrease of 8,343. In the subjoined table they are given for each district, and for the last 9 years the annual death-rate from small-pox, the

mean and ratios per 1,000 of population, and the deaths and their ratios are given for 1881 and 1882 (see diagram on opposite page) :—

Division.	Number.	Districts	Population according to Census of 1881.	Deaths from Small-pox in 1872	1873	1874	1875	1876	1877	1878	1879	1880	Mean for 9 years from 1872 to 1880.	Ratio per 1,000 of Population on Census of 1872.	1881.	Ratio per 1,000 of Population on Census of 1881.	1882.	Ratio per 1,000 of Population on Census of 1881.
Northern Deccan.	1	Khándesh	1,237,225	2,696	722	123	22	1,466	3,774	240	66	1	1,040	1·71	6	0·00	131	0·11
	2	Násik	781,256	2,155	179	48	69	872	2,431	68	3	1	716	1·02	4	0·01	26	0·04
	3	Ahmednagar	1,734,228	2,264	418	72	46	1,008	1,978	71	2	..	569	0·73	..	..	6	0·01
	4	Poona	1,000,621	2,121	202	129	146	686	1,457	48	24	..	556	0·61	..	..	506	0·56
	5	Sholápur	582,487	2,543	226	29	19	113	1,060	22	..	..	427	0·80	..	..	4	0·01
Southern Deccan.	6	Sátára	1,062,350	2,219	594	71	99	207	953	59	2	2	495	0·49	..	..	2	0·00
	7	Belgaum	964,014	2,152	209	527	695	706	1,112	165	6	2	744	0·79	4	0·00	47	0·01
	8	Dhárwár	882,907	1,655	1,258	485	226	498	2,642	109	..	..	980	0·87	..	..	13	0·01
	9	Kaládgi	630,455	1,765	251	280	115	87	801	18	10	1	396	0·48	..	..	7	0·01
Konkan.	10	Kánara	421,840	1,179	402	294	237	28	473	66	8	1	292	0·73	1	0·00	51	0·12
	11	Ratnágiri	997,096	874	713	221	103	1,308	1,979	98	24	22	457	0·45	19	0·02	8	0·01
	12	Kolába	391,649	94	143	150	72	209	525	86	41	67	134	0·44	49	0·13	90	0·24
	13	Bombay City	773,196	1,854	709	258	146	3,143	905	253	475	206	813	1·05	57	0·05	91	0·12
	14	Thána	906,543	199	1,317	256	266	748	1,301	81	5	5	502	0·55	16	0·02	229	0·26
Gujarát.	15	Surat	614,196	101	454	216	255	429	2,193	91	4	2	437	0·79	7	0·01	89	0·14
	16	Broach	228,350	74	106	79	17	21	1,036	154	7	..	171	0·49	2	0·01	..	..
	17	Kaira	804,880	153	1,226	91	608	109	125	1,063	5	..	333	0·49	1	0·00	5	0·01
	18	Panch Mahals	353,479	9	106	6	18	39	41	209	2	..	49	0·20	2	0·01	4	0·02
	19	Ahmedabad	850,334	201	305	208	127	217	144	1,158	19	..	290	0·36	..	..	23	0·03
Sind.	20	Karáchi	479,666	148	69	18	5	74	151	13	7	82	69	0·15	102	0·21	65	0·13
	21	Hyderabad	784,634	96	5	1	7	176	280	113	54	89	90	0·12	35	0·07	69	0·13
	22	Thar and Párkar	203,544	16	..	5	30	7	6	12	7	7	11	0·06	4	0·02	1	0·00
	23	Shikárpur	852,066	..	6	5	1	66	..	200	283	400	123	0·17	202	0·24	29	0·03
	24	Upper Sind Frontier	134,161	11	2	3	..	..	6	4	66	63	17	0·19	28	0·21	..	..

ABSTRACT.

Northern Deccan	..	8,705,773	11,966	1,943	361	206	3,686	12,575	807	135	1	2,546	0·93	19	0·00	679	0·16
Southern Deccan	..	3,447,764	10,089	2,474	1,079	1,304	1,439	5,305	293	19	10	1,604	0·66	4	0·00	70	0·03
Konkan	..	3,482,324	4,374	3,111	1,371	845	5,487	4,208	636	553	300	2,215	0·71	123	0·04	569	0·18
Gujarát	..	2,807,731	537	2,437	901	1,057	929	5,530	5,673	21	2	1,327	0·47	12	0·00	121	0·04
Sind	..	2,453,923	270	80	31	49	317	452	447	417	618	297	0·12	391	0·15	192	0·08
	Total	20,454,414	26,699	9,905	3,803	3,461	11,857	27,969	4,476	1,126	940	6,972	0·61	539	0·05	1,630	0·15

In the above table an increase is observable in every division excepting Sind, and in every district excepting Ratnágiri, Karáchi, Thar and Párkar and Shikárpur,—Broach and Upper Sind Frontier being entirely free. In the remaining 18 districts, Poona stands first with a maximum of 506 deaths. Next is Thána with 328, and Khándesh with 131. In 6 districts the number of deaths is above 50, but below 100. In 5 districts the number is above 10 and below 50. In 8 the number is below 10. By divisions the Northern Deccan stands first with a maximum number of 679 deaths, and the Southern Deccan with a minimum of 70 deaths.

54. The next table shows the deaths for each month, those under 1 year, under 12 and above 12, and it will be seen from it that the minimum mortality was amongst infants under 1 year, and the maximum amongst those above 12 years :—

	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Total deaths from small-pox in each month	41	45	66	107	129	146	148	98	81	98	201	479	1,630
Deaths under 1 year	15	7	14	25	25	19	23	17	18	21	31	96	311
Do. do 12 years	14	10	31	36	40	56	39	29	22	20	63	203	563
Do. above 12 do.	12	28	21	46	55	71	86	52	41	57	107	180	756

Diagram

Showing for the Bombay Presidency the mortality from Smallpox from 1872 to 1880 inclusive, the mean for 9 years, and the mortality for 1881 & 1882.

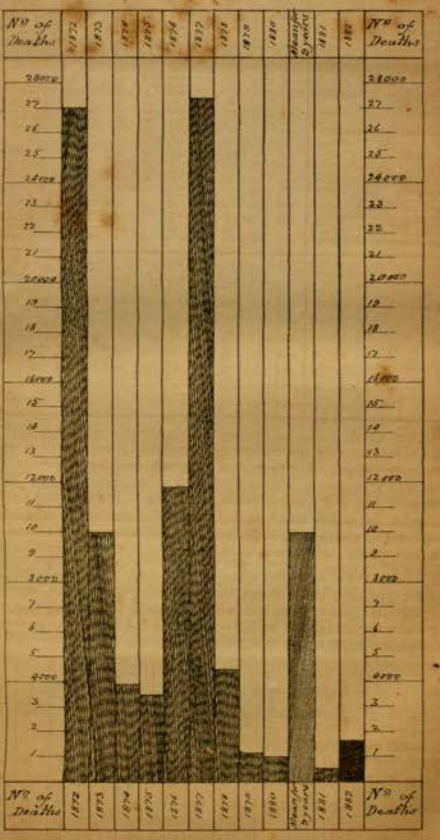


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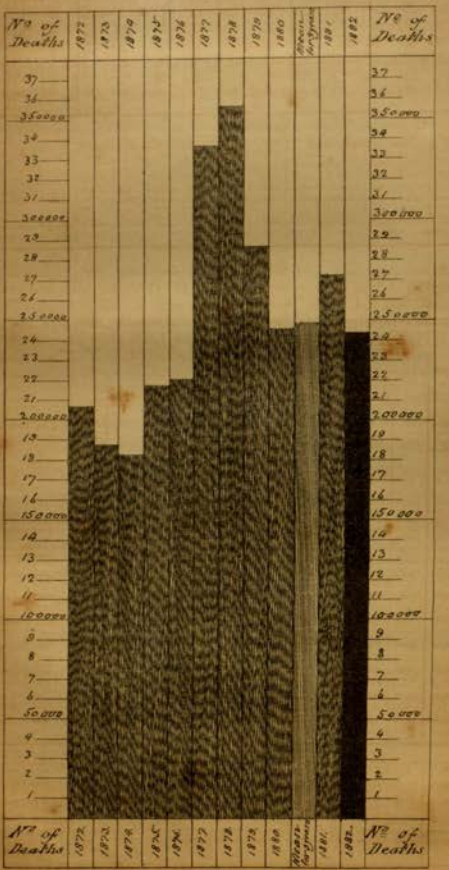
Diagram

showing for the Bombay Presidency the mortality from Fever from 1872 to 1880 — inclusive, the mean for 9 years and the — mortality for 1881 & 1882.



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Govt. Photozincographic Office, Poona, 1883

55. In the following table the deaths are shown by seasons, and it will be seen that during the year in each month, with a single exception (March), the numbers of deaths are greater than the previous year. The deaths gradually increased from 41 in January to 148 in July. In August the number fell to 98, to 81 in September, again rose to 98 in October, reaching its maximum 479 in December :—

Years.	Cold Season (121 Days).				Hot and Dry (61 Days).		Rainy Season (122 Days).				Hot and Damp (61 Days).		Total Deaths from Small-pox.
	December (31).	January (31).	February (29).	March (31).	April (30).	May (31).	June (30).	July (31).	August (31).	September (30).	October (31).	November (30).	
1872	727	2,060	2,619	3,347	4,482	3,479	2,549	1,901	1,092	556	439	614	26,080
1873	186	1,184	1,253	1,961	1,962	1,340	895	626	301	179	127	189	9,955
1874	312	299	307	659	606	500	466	387	161	125	119	154	5,909
1875	170	205	408	479	577	492	393	234	165	115	91	93	3,461
1876	2,437	2,844	3,051	3,252	4,159	3,174	2,259	1,477	1,056	709	564	1,095	11,817
1877	649	4,005	4,427	5,949	5,997	3,525	1,639	911	514	347	217	228	27,369
1878	73	477	694	1,162	903	571	398	184	46	44	27	32	4,473
1879	70	139	72	122	162	179	174	90	41	44	19	33	1,156
1880	88	92	150	194	146	117	91	43	24	20	13	12	946
Mean	461	1,044	1,376	1,669	1,671	1,319	991	515	312	191	160	256	9,373
1881	55	56	65	79	89	81	84	37	28	15	12	5	599
1882	479	41	45	68	107	129	146	146	98	83	98	201	1,630

ABSTRACT.

Seasons.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	Mean.	1881.	1882.
Cold	11,824	4,804	3,986	1,411	5,527	15,180	2,404	435	463	4,837	186	621
Hot and Dry ..	7,961	2,287	1,106	1,066	7,333	9,422	1,476	371	261	3,494	170	277
Rainy	3,841	1,309	1,092	857	2,923	3,402	580	299	189	1,825	164	473
Hot and Damp ..	1,065	287	255	184	1,414	445	39	53	27	418	17	299
Total ..	26,690	9,953	5,960	3,481	11,817	27,569	4,473	1,156	940	9,573	539	1,630

FEVER.

56. The deaths from fever in 1882 were 243,454 (128,364 males and 115,090 females) against 272,403, thus showing a decrease of 28,949 deaths during the year. In the following table these deaths are shown by districts and divisions since 1872; the 9 years' mean and ratios per 1,000 of population are also given, together with the deaths and their ratios for 1881 and 1882 (see diagram on opposite page) :—

Division.	Number.	Districts.	Population according to Census of 1881.	Deaths from Fever in									Mean Annual Number of Deaths from Fever.	Mean Ratio per 1,000 of Population on Census of 1872.	1881.	Ratio per 1,000 of Population on Census of 1881.	1882.	Ratio per 1,000 of Population on Census of 1882.
				1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.						
Northern Division.	1	Khándesh	1,237,231	14,438	10,936	11,994	10,907	15,060	24,766	23,489	14,895	17,150	15,579	12·14	21,497	17·70	25,854	17·65
	2	Násik	761,206	12,429	9,079	8,591	11,167	12,008	14,999	21,300	11,709	11,481	12,534	17·04	16,527	20·90	13,527	19·16
	3	Ahmednagar	751,238	13,888	7,262	9,059	12,063	13,501	19,424	20,541	12,455	10,542	12,948	18·72	15,562	19·68	20,712	14·96
	4	Poona	900,321	14,127	11,418	9,711	12,016	15,342	19,753	25,013	9,389	10,522	14,659	14·94	13,917	15·83	12,420	12·98
	5	Sholápur	382,487	6,620	5,484	6,603	8,725	10,059	16,041	17,023	11,090	7,823	10,217	14·12	6,531	14·60	7,063	19·67
Southern Division.	6	Sátára	1,007,326	17,913	13,746	14,772	14,091	16,705	21,553	27,351	17,286	17,083	19,161	16·66	17,940	19·24	16,395	15·43
	7	Belgaum	964,014	8,761	6,616	6,625	10,772	12,651	17,782	23,561	14,923	15,600	14,042	12·92	17,874	18·75	9,932	11·50
	8	Dhárwár	687,907	10,295	9,196	11,165	17,818	15,515	20,915	29,983	17,802	13,917	18,963	19·12	12,588	14·69	11,445	12·97
	9	Kaládgi	636,408	8,296	8,777	7,750	9,469	9,757	11,249	16,872	14,572	11,554	12,355	16·98	10,025	15·70	9,153	12·71
Konkan.	10	Kánara	427,840	3,709	4,823	3,324	6,205	6,452	10,623	11,543	8,857	7,151	7,444	16·48	7,944	17·17	6,959	14·96
	11	Ratnágiri	997,090	6,074	7,570	6,519	9,057	7,491	9,849	10,967	10,955	11,802	9,057	9·17	8,503	8·99	8,353	9·28
	12	Kolába	561,649	3,503	3,145	2,784	3,759	3,812	5,401	4,213	4,737	5,064	3,990	10·27	5,543	14·55	5,458	14·03
	13	Bombay City ..	773,196	7,512	8,150	5,245	5,150	8,856	12,758	9,905	8,441	7,591	7,959	11·82	5,411	8·29	5,431	7·93
	14	Thána	908,234	13,507	11,307	11,783	11,976	13,040	15,746	16,017	14,189	14,707	14,040	16·58	17,040	19·68	16,809	17·95
Gujarát.	15	Surat	614,109	12,955	12,973	10,700	11,678	10,915	8,865	10,443	13,617	12,265	11,898	18·79	14,665	22·87	10,696	17·49
	16	Broach	229,309	6,112	6,906	6,047	7,409	5,956	5,253	11,350	13,755	9,470	7,899	27·45	10,923	39·14	4,019	17·19
	17	Kaira	604,840	13,906	13,180	11,549	14,120	13,564	11,913	25,915	26,727	20,475	20,917	33·91	25,157	37·72	14,614	18·16
	18	Panch Mahálsi ..	255,479	3,091	3,113	2,751	3,599	4,016	3,937	8,136	3,653	3,407	3,947	16·79	4,351	16·25	3,858	14·94
	19	Ahmedabad	836,324	15,496	13,645	13,998	14,186	15,332	13,756	25,324	20,807	20,540	17,160	20·67	23,351	24·82	16,171	18·98
Sind.	20	Karáchi	479,668	6,871	4,997	3,615	3,259	4,911	3,350	5,823	4,867	4,745	4,893	11·45	7,113	14·86	6,908	14·43
	21	Hyderabad	734,934	9,509	6,235	4,644	4,913	6,055	7,178	9,387	7,214	6,270	6,840	9·17	8,907	11·84	9,894	13·15
	22	Thar and Párkar	203,344	606	616	370	890	1,379	2,055	3,377	1,749	1,509	1,556	8·96	2,243	10·94	2,111	10·30
	23	Shikárpur	852,988	..	4,366	2,620	4,597	7,279	6,494	6,617	5,508	5,431	*6,086	8·70	7,617	8·93	10,772	12·66
	24	Upper Sind Frontier	124,181	612	488	769	607	916	692	602	568	459	614	6·82	667	5·37	1,110	8·94

ABSTRACT.

Northern Deccan	4,352,772	58,112	43,779	45,595	60,826	69,312	93,403	102,732	62,515	57,357	64,712	15·56	74,599	17·46	67,005	15·71
Southern Deccan	3,447,704	43,471	37,139	42,121	56,084	57,656	137,985	96,496	68,593	57,799	66,941	17·36	52,145	16·12	45,867	12·23
Konkan	4,407,926	39,362	39,547	32,375	52,474	55,342	59,926	72,344	58,189	46,376	51,198	12·94	45,576	12·97	41,869	12·91
Gujarát	2,807,734	49,474	50,918	45,673	50,490	48,981	43,523	78,913	80,031	66,761	67,264	23·96	73,756	32·63	50,908	17·81
Sind	2,413,623	17,598	17,297	16,806	16,272	20,740	21,739	24,092	19,556	15,921	19,555	8·25	27,875	11·44	27,786	13·66
Total ..	19,434,414	208,747	188,201	182,717	218,156	230,625	356,585	367,576	288,884	246,779	269,670	13·56	272,400	14·06	243,454	14·09

* Mean for 8 years only.

From the above table it will be seen that, excepting the Sind Division (especially the districts of Hyderabad, Shikárpur and Thar and Párkar), the deaths from fever have decreased in every division and in every district. The cause of increase in Sind Division is stated by Mr. J. C. H. Peacocke, the Acting Deputy Sanitary Commissioner, Sind Registration Districts, as follows :—

"The greatly increased number of deaths in the Shikárpur District from fever is, I think, due to the inundations, and as is usual the greatest number was registered in November. That this month is peculiarly unhealthy in the Shikárpur and Jacobabad Divisions, is clearly shown, whilst the colder months December to March are most fatal in the three remaining districts."

57. The next table shows the mortality by the conventional seasons for each year from 1872, mean for 9 years (1872 to 1880), and totals for 1881 and 1882. It will be seen that the deaths in each season are less than the previous year; but although in the hot and dry season they exceed the mean, yet for the year they are lower by 6,124 than the average total. By months the number of deaths during March and May were more numerous than in the corresponding month of the previous year, and in February, March, April, May and June they are higher than the numbers for the mean of the corresponding months of the 9-year period :—

Years.	Cold Season (121 Days).			Hot and Dry (61 Days).		Rainy Season (122 Days).				Hot and Damp (61 Days).		Total Deaths from Fever.
	December (31).	January (31).	February (30).	March (31).	April (30).	May (31).	June (30).	July (31).	August (31).	September (30).	October (31).	November (30).	
1872	18,102	16,504	15,091	16,343	11,880	14,459	14,901	16,499	19,463	18,326	15,459	21,510	200,747
1873	18,985	19,628	14,092	15,207	12,730	12,972	12,438	13,577	14,995	13,556	17,972	19,997	186,201
1874	16,379	17,162	13,708	15,349	12,915	12,439	13,013	12,878	14,814	13,879	17,260	19,214	181,712
1875	20,550	17,450	14,810	16,003	17,048	17,212	17,307	19,476	20,374	19,208	18,393	21,253	219,156
1876	21,820	19,258	17,406	17,449	16,597	16,491	15,043	17,726	19,808	19,272	18,860	21,250	230,838
1877	24,749	19,007	17,686	22,256	23,503	24,986	24,046	29,221	33,734	34,223	32,753	26,807	330,965
1878	22,344	21,004	23,373	23,634	24,372	23,839	24,359	28,674	34,443	32,719	26,459	27,184	327,376
1879	27,650	27,179	21,923	20,993	19,773	20,040	18,715	20,709	24,963	25,353	23,616	22,143	296,526
1880	22,565	24,639	23,625	23,911	19,909	18,579	16,572	18,923	19,654	18,596	18,400	22,326	246,779
Mean	21,344	21,416	17,842	18,998	15,390	16,338	17,311	19,849	22,404	22,228	23,660	26,060	249,878
1881	26,275	24,742	21,057	21,354	21,222	16,862	17,774	20,439	25,009	24,756	24,736	26,089	272,465
1882	22,531	21,805	20,756	21,909	16,743	19,089	15,357	17,514	19,534	19,654	21,846	25,377	243,454

ABSTRACT.

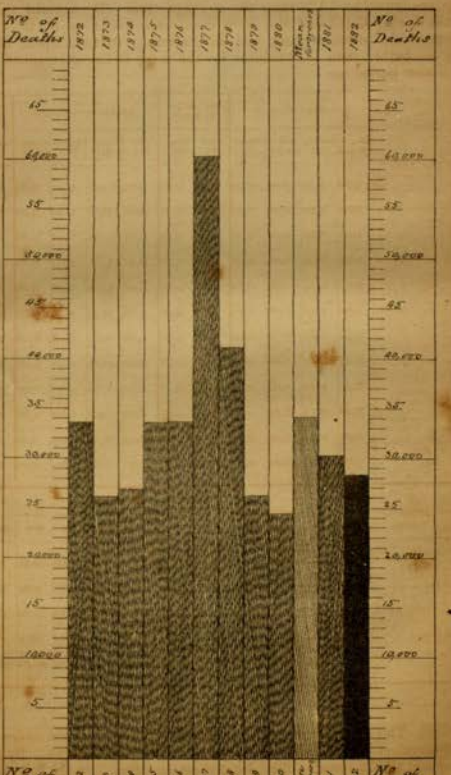
Seasons.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	Mean.	1881.	1882.
Cold	68,022	67,472	64,580	69,851	75,872	94,300	110,547	97,502	93,890	82,600	93,426	86,627
Hot and Dry	30,269	27,661	27,345	34,260	33,091	48,506	50,201	39,772	39,498	36,830	40,294	37,852
Rainy	69,078	56,560	53,261	76,462	72,026	125,350	122,194	93,400	73,740	81,797	87,960	73,659
Hot and Damp	41,248	36,508	36,501	39,030	39,849	72,090	73,634	60,761	40,742	48,071	50,785	46,965
	206,747	188,201	181,717	219,156	220,838	336,465	357,376	296,536	246,779	249,878	272,465	243,454

BOWEL-COMPLAINTS.

58. The deaths from bowel-complaints during the year under report were 28,353 against 30,342 last year, showing a decrease of 1,989. By sexes 15,630 males and 12,723 females died from these diseases. In the following table the deaths are shown for each district since 1872, the mean ratios per 1,000 of population for 9 years, and the deaths and their ratios for 1881 and 1882 (see diagram on opposite page) :—

Diagram

Showing for the Bombay Presidency, the mortality from Bowel complaints, from 1872 to 1880 inclusive, the mean for 9 years, and the mortality for 1881 & 1882.



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Division	No.	Districts.	Deaths from Bowel-complaints in													
			Population according to Census of 1881.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	Mean for 9 years from 1872 to 1880.	Ratio per 1,000 of Population on Census of 1872.	1881.	Ratio per 1,000 of Population on Census of 1881.	1882.	Ratio per 1,000 of Population on Census of 1881.
Northern Deccan.	1	Khándesh ..	1,227,321	3,004	3,699	3,439	3,327	3,079	3,227	4,830	2,451	3,370	3,192	2·62	4,355	3·62	4,326	3·48
	2	Násik ..	761,256	1,856	1,106	1,107	1,116	1,030	1,784	2,016	1,122	1,593	1,537	2·00	1,791	2·29	1,851	2·74
	3	Ahmednagar ..	751,226	2,073	1,556	1,029	1,641	2,493	2,864	2,167	1,481	1,296	1,800	2·36	1,709	2·23	1,884	1·82
	4	Poona ..	900,521	2,103	1,646	1,393	1,866	1,744	2,276	1,509	897	1,006	1,537	1·70	1,463	1·62	1,585	1·69
	5	Sholápur ..	563,467	2,702	941	1,303	1,365	1,791	5,019	2,230	1,490	953	1,955	3·58	942	1·93	906	1·54
Southern Maratha Country.	6	Sátára ..	1,062,856	4,084	2,464	2,064	3,229	3,990	7,786	4,121	1,494	1,187	3,153	2·97	1,621	1·54	1,844	1·71
	7	Belgaum ..	864,614	1,321	1,439	1,953	2,818	2,654	6,852	2,540	1,901	2,543	2,649	3·06	3,020	3·50	3,515	3·66
	8	Dhárwár ..	992,907	2,894	4,599	4,335	4,898	4,718	12,230	4,972	2,481	2,038	5,126	5·16	3,457	3·57	3,511	3·68
	9	Kaládgi ..	626,488	1,500	720	742	963	1,402	6,107	556	404	1,923	1,690	2·82	1,264	2·01	1,611	1·58
Konkan.	10	Kánara ..	433,949	939	852	1,057	1,254	1,196	1,345	1,501	1,067	854	1,214	2·65	803	1·92	731	1·78
	11	Ratnagiri ..	907,090	870	1,038	1,483	1,529	1,561	2,909	1,851	2,022	1,215	1,556	1·41	1,398	1·49	852	0·83
	12	Kolába ..	961,642	1,579	149	143	199	223	1,000	250	130	145	384	0·37	88	0·08	107	0·28
	13	Bombay City ..	773,196	1,679	1,361	1,007	2,528	1,963	2,544	3,428	2,467	1,463	2,185	2·41	2,004	2·59	1,586	2·05
	14	Thána	989,549	551	508	978	483	540	362	246	236	168	508	0·44	253	0·25	258	0·26
Gujarát.	15	Surat	614,199	1,055	1,393	1,245	1,173	1,223	1,294	1,420	1,000	1,209	1,204	2·21	1,741	2·83	1,291	2·10
	16	Broach	336,599	514	531	361	499	411	1,437	927	681	599	757	1·79	674	2·00	498	1·48
	17	Kaira	804,660	1,845	2,108	1,647	2,004	1,981	1,938	2,902	1,676	1,210	1,960	2·03	2,017	2·50	1,708	2·28
	18	Panch Mahals ..	256,479	149	291	115	125	115	121	1,091	170	120	317	1·44	108	0·41	109	0·39
	19	Ahmedabad ..	836,224	1,309	1,202	964	1,013	1,414	771	2,227	1,790	964	1,315	1·61	1,218	1·42	1,138	1·32
Sind.	20	Karáchi	478,868	135	79	101	47	74	46	97	108	167	94	0·22	171	0·35	287	0·56
	21	Hyderabad ..	754,624	97	48	46	79	84	75	167	97	99	77	0·11	71	0·09	79	0·10
	22	Thar and Párkar ..	202,544	31	41	58	56	58	51	94	126	99	81	0·37	74	0·36	76	0·36
	23	Shikárpur	502,246	..	..	180	219	302	302	359	279	176	*302	0·60	193	0·38	209	0·41
	24	Upper Sind Frontier.	124,197	25	15	49	14	16	13	11	47	45	26	0·20	45	0·36	39	0·31

ABSTRACT.

Northern Deccan	4,253,772	10,831	7,337	8,451	11,435	10,73	4,871	15,501	7,45	7,341	10,18	2·40	10,66	2·46	9,654	2·27
Southern Deccan	3,481,883	12,313	9,153	9,305	12,246	12,23	21,780	11,240	6,95	7,80	12,42	3·56	11,64	3·34	12,746	3·66
Konkan	3,482,325	4,139	4,107	4,690	5,666	5,32	5,712	6,041	5,27	4,201	5,51	1·69	4,527	1·30	3,572	1·03
Gujarát	2,811,761	5,183	5,314	4,331	4,814	5,17	4,845	8,567	6,06	4,599	5,14	1·80	5,748	1·92	4,793	1·58
Sind	2,413,822	288	187	451	415	586	586	443	536	506	419	0·18	489	0·20	864	0·24
Total ..	16,434,414	32,954	26,259	26,900	32,650	31,03	36,307	41,160	26,349	24,457	34,052	2·10	30,845	1·94	31,358	1·72

*Mean for 8 years only.

From the above table it will be seen that there is a slight increase in the number of deaths from bowel-complaints during the year under report when compared with those of last year in the Southern Deccan and Sind, and a decrease in the three divisions—Northern Deccan, Konkan and Gujarát. By districts there is an increase in 11 and a decrease in 13. The highest and lowest ratios are 3·98 in Dhárwár and 0·04 in Thar and Párkar.

59. The next table shows the deaths by seasons from 1872, the mean for 9 years, and the numbers for 1881 and 1882. It will be found that in all the seasons the deaths are less than in 1881 and the mean; and by months they exceed in February, March, May, June and July the numbers of the corresponding months of the previous year and in February only of the mean :—

Years.	Cold Season (121 Days).				Hot and Dry (61 Days).		Rainy Season (123 Days).				Hot and Damp (61 Days).		Total Deaths from Bowel-complaints.
	December (31).	January (31).	February (28).	March (31).	April (30).	May (31).	June (30).	July (31).	August (31).	September (30).	October (31).	November (30).	
1872	2,097	2,551	2,078	2,133	2,075	2,366	2,656	3,097	4,891	3,966	3,045	2,523	32,861
1873	2,141	2,767	1,945	1,746	1,940	2,420	3,099	3,824	3,914	3,440	2,284	1,819	30,339
1874	2,808	3,062	1,639	1,892	1,860	2,011	2,396	2,793	3,054	2,479	2,457	2,531	26,990
1875	1,810	2,254	1,907	2,147	2,130	2,902	3,711	4,071	5,284	4,571	2,344	2,044	32,600
1876	2,691	3,219	2,132	2,351	2,535	2,662	2,980	3,357	4,125	3,521	2,655	2,681	32,953
1877	3,014	3,177	2,747	3,270	3,437	4,261	5,012	6,736	8,698	8,170	6,825	4,375	60,257
1878	2,752	2,668	1,893	2,226	2,305	2,734	3,256	4,061	6,275	5,466	3,478	1,979	38,565
1879	1,153	1,473	1,205	1,296	1,760	1,983	2,745	3,297	2,890	2,674	2,496	2,156	26,149
1880	2,181	2,065	1,340	1,964	1,760	1,758	1,769	2,160	2,561	2,351	1,943	2,065	21,426
Mean ..	2,412	2,527	1,876	2,190	2,251	2,469	2,726	3,400	4,374	3,909	3,189	2,670	34,052
1881	2,666	3,235	1,884	1,994	2,117	2,197	2,047	2,606	2,738	3,213	3,007	1,567	30,542
1882	2,326	3,123	2,053	2,011	1,886	2,202	2,184	2,854	3,149	2,954	2,599	2,198	29,559

ABSTRACT.

Seasons.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	Means.	1881.	1882.
Cold	8,979	7,814	7,900	6,073	8,331	11,078	9,695	5,558	8,024	8,253	9,696	9,317
Hot and Dry ..	4,326	3,926	3,671	4,346	5,173	7,778	5,103	3,043	5,466	4,694	4,324	4,286
Rainy	17,734	9,703	10,377	14,598	13,941	29,951	13,470	9,696	8,933	14,541	13,716	10,961
Hot and Damp ..	5,308	4,914	4,993	6,584	5,508	11,198	6,948	4,952	4,927	6,500	5,649	4,997
Total ..	36,347	26,359	26,940	31,010	33,953	60,057	41,216	23,249	27,350	34,008	33,345	29,561

INJURIES.

60. There were 5,913 deaths from injuries, of which 3,496 occurred among males and 2,417 among females; the ratio per 1,000 of population was 0·36. For 1881 the total was 5,950, the ratio being 0·36. This shows a decrease in the total

of 37 deaths, the ratio being unchanged. Of the 5,913 deaths, 2,642 were caused by drowning, 1,277 resulted from snake-bites, 1,245 from causes other than those specified, 361 from wounds, 214 by hanging, 103 by poisoning, and 71 from attacks by wild beasts. They are shown by sexes in the subjoined table (see diagram on opposite page):—

	1882.			1881.		
	Males.	Females.	Total.	Males	Females.	Total.
Drowning...	1,255	1,387	2,642	1,213	1,423	2,636
Poisoning	58	45	103	75	38	113
Hanging	124	90	214	134	83	217
Wounding	249	112	361	267	115	382
Wild beasts	53	18	71	90	30	120
Snake-bites	847	430	1,277	788	421	1,209
Other causes	910	335	1,245	857	416	1,273
Total ...	3,496	2,417	5,913	3,424	2,526	5,950

It will be seen from the above table that under drowning and snake-bites there is an increase of 74 deaths; and under poisoning, hanging, wounding, wild beasts, and other causes there is a decrease of 111 deaths during the year under report than in 1881. The net decrease, therefore, is 37.

61. The next table gives the deaths from injuries since 1872, their means and ratios per 1,000 of population for 9 years for each district and division, as also for 1881 and 1882. It will be seen that the number of deaths during the year is in excess of the mean and of the previous year in all the divisions excepting Northern Deccan, where a decrease of 214 and 117 below the mean and the total of the previous year respectively is found. In only two divisions—Konkan and Sind—the number of deaths exceed the mean. In 12 districts the deaths exceed those of the previous year, and in 8 districts they exceed the mean.

Division.	Number.	Districts.	Population according to Census of 1881.	Deaths from Injuries in									Mean for 9 years from 1872 to 1880.	Ratio per 1,000 of Population on Census of 1872.	1881.	Ratio per 1,000 of Population on Census of 1881.	1882.	Ratio per 1,000 of Population on Census of 1881.
				1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.						
Northern Deccan.	1	Khándesh	1,327,221	471	383	299	326	304	316	332	297	257	323	0·32	293	0·24	272	0·20
	2	Násik	761,046	226	184	147	159	167	169	169	159	177	171	0·24	149	0·20	127	0·17
	3	Ahmednagar ..	731,238	176	188	179	168	146	180	247	207	149	187	0·28	161	0·22	160	0·22
	4	Poona	900,621	249	184	264	204	197	230	249	206	227	259	0·32	230	0·27	203	0·23
	5	Sholápur	682,467	214	200	200	193	181	189	205	204	214	218	0·33	177	0·26	193	0·28
Southern Deccan.	6	Sátára	1,062,330	337	413	339	326	371	405	476	434	370	307	0·29	319	0·30	327	0·31
	7	Belgaum	954,914	316	313	325	323	291	319	457	414	339	368	0·39	337	0·35	337	0·35
	8	Dhárwár	883,807	347	335	327	323	299	308	377	342	305	335	0·38	340	0·38	340	0·38
	9	Kaládgi	638,403	251	229	209	207	242	238	402	317	309	257	0·41	249	0·39	234	0·36
Konkan.	10	Kánara	431,849	199	229	185	271	221	261	295	194	209	234	0·56	225	0·53	239	0·57
	11	Ratnágiri	997,990	332	365	279	297	298	435	452	346	479	367	0·40	373	0·38	356	0·39
	12	Kolába	361,649	142	187	132	128	139	154	148	115	115	139	0·37	143	0·37	145	0·38
	13	Bombay City ..	773,196	294	221	227	209	254	251	304	260	258	256	0·48	300	0·45	256	0·40
	14	Thána	909,548	417	365	446	430	391	468	505	426	398	428	0·51	404	0·44	428	0·49
Gujarát.	15	Surat	614,188	300	256	223	236	242	262	260	236	205	279	0·44	235	0·38	243	0·40
	16	Broach	336,930	103	117	107	100	111	107	109	103	103	107	0·31	116	0·34	136	0·40
	17	Kaira	804,680	274	245	227	207	274	252	241	230	263	248	0·31	229	0·28	261	0·32
	18	Pánch Mahals ..	353,479	101	110	135	117	97	127	153	120	102	120	0·33	97	0·27	61	0·17
	19	Ahmedabad ..	656,238	261	271	250	300	256	257	295	223	214	262	0·39	268	0·39	261	0·39
Sind.	20	Karáchi	479,686	214	256	271	300	227	265	302	279	259	276	0·57	250	0·51	261	0·53
	21	Hyderabad	714,584	343	429	361	404	308	450	504	511	454	426	0·59	410	0·57	411	0·54
	22	Thar and Párkar	262,544	67	60	61	56	55	81	73	56	77	67	0·25	67	0·25	59	0·22
	23	Shikárpur	652,986	..	250	352	301	313	376	317	257	292	299	0·29	343	0·40	335	0·39
	24	Upper Sind Frontier ..	134,131	35	42	49	32	69	40	40	20	20	36	0·42	20	0·14	46	0·33

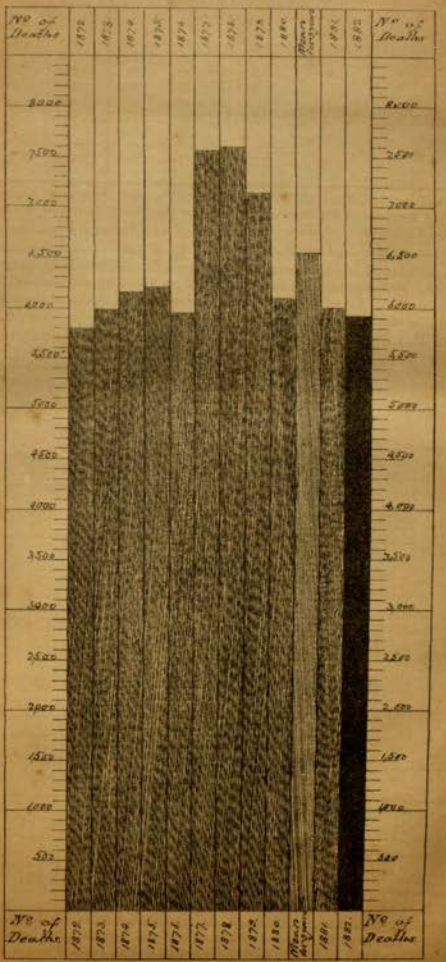
ABSTRACT.

Northern Deccan	4,852,572	1,389	1,243	1,190	1,113	1,086	1,205	1,421	1,203	1,134	1,222	0·29	1,125	0·26	1,068	0·24
Southern Deccan	3,447,564	1,156	1,197	1,059	1,032	1,190	1,163	1,668	1,426	1,249	1,317	0·40	1,197	0·35	1,220	0·35
Konkan	3,473,232	1,284	1,167	1,264	1,264	1,203	1,408	1,534	1,279	1,259	1,330	0·46	1,305	0·42	1,252	0·44
Gujarát	2,807,515	1,040	1,054	1,142	1,133	992	1,056	1,161	1,091	1,044	1,101	0·39	955	0·33	998	0·35
Sind	2,443,803	667	1,056	1,305	1,329	1,067	1,191	1,326	1,176	1,092	1,154	0·53	1,177	0·49	1,160	0·48
	16,624,414	5,864	5,963	6,167	5,971	5,538	7,539	7,550	7,107	6,082	6,462	0·40	5,959	0·36	5,913	0·36

62. The next table gives the deaths from snake-bites month by month from 1877 to 1882 inclusive, and the means for that period are contrasted with

Diagram

Showing for the Bombay Presidency, the mortality from Injuries from 1872 to 1880 inclusive, the mean for 9 years and the mortality for 1881 & 1882.



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the totals of 1882. The cases were most frequent during the rainy season, as they usually are :—

Months.	Years.						
	1877.	1878.	1879.	1880.	1881.	Mean for 5 years.	1882.
January	18	33	29	26	39	29	35
February	16	23	28	20	34	22	39
March	41	52	37	49	55	47	47
April	34	52	51	50	55	49	63
May	105	88	96	94	95	96	102
June	143	100	128	159	162	138	149
July	178	126	146	177	191	164	168
August	232	123	133	150	165	161	189
September	183	161	141	159	161	161	211
October	112	122	154	177	128	139	166
November	75	64	63	78	80	72	71
December	44	39	38	40	44	41	37
	1,181	983	1,044	1,179	1,209	1,119	1,277

63. They are similarly shown by localities, and, as usual, the highest number—190—is from Hyderabad, Thána follows with 156, and Ratnágiri with 149. In the Bombay City there were only 5.

Districts.	Years.						
	1877.	1878.	1879.	1880.	1881.	Mean for 5 years.	1882.
Khándesh	41	24	34	39	44	36	25
Násik	10	9	21	29	21	18	13
Ahmednagar	11	9	7	26	17	14	18
Poona	19	25	25	26	21	23	31
Sholápur	4	9	2	11	9	7	10
Sátára	41	34	49	51	44	44	46
Belgaum	28	31	23	31	43	31	34
Dhárwár	16	18	29	23	36	24	24
Kaládgi	13	7	18	19	32	18	33
Kánara	37	33	25	20	27	28	22
Ratnágiri	102	151	159	174	164	150	149
Kolába	19	28	20	24	25	23	32
Bombay City	3	6	6	10	2	5	5
Thána	129	103	122	107	121	117	156
Surat	48	35	40	50	54	46	49
Broach	28	14	16	14	26	20	35
Kaira	90	50	46	79	60	65	61
Panch Mahals	60	21	25	36	28	34	29
Ahmedabad	58	28	42	39	31	40	64
Karáchi	98	64	71	87	99	84	87
Hyderabad	206	195	190	193	186	194	190
Thar and Párkar	57	27	29	42	42	39	78
Shikárpur	55	59	43	46	74	55	77
Upper Sind Frontier	8	3	2	3	3	4	9
	1,181	983	1,044	1,179	1,209	1,119	1,277

64. In the following table deaths from injuries are detailed under specified headings, and it will be seen that of the 2,642 deaths by drowning, 424 were suicidal and 1,994 were accidental, and 224 are entered as "otherwise", and this means that when the return was made up by they could neither be pronounced suicidal nor accidental. There were 1,241 deaths by drowning in wells against 1,346 in 1881. Of the 685 suicidal deaths there were 424 by drowning, 56 by poisoning, 195 by hanging, and 10 by wounding :—

| 1 | 2 | | |

OTHER CAUSES.

65. The recorded deaths from causes other than those specified numbered 56,164, of whom 29,286 occurred among males and 26,878 among females. The total for 1881 was 55,522: so for this year there is an increase of 642. In the following table these deaths from other causes are shown for each district since 1872; there are also given the means and ratios per 1,000 of population, and the numbers and ratios for 1881 and 1882:—

Division.	Number.	Districts.	Population according to Census of 1881.	Deaths from "Other Causes" in									Mean for 9 years from 1872 to 1880.	Ratio per 1,000 of Population on Census of 1872.	1881.	Ratio per 1,000 of Population on Census of 1881.	1882.	Ratio per 1,000 of Population on Census of 1881.
				1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.						
Northern Deccan.	1	Khándesh	1,237,321	1,172	612	709	1,080	640	624	1,481	515	592	847	0·96	734	0·59	721	0·58
	2	Násik	781,998	2,618	2,024	3,198	2,967	3,173	3,744	3,450	1,796	1,427	2,741	3·50	1,919	2·45	1,903	2·43
	3	Ahmednagar ...	751,238	2,441	1,606	1,913	3,047	2,016	2,649	3,015	2,206	2,154	2,371	3·22	3,184	4·24	3,024	2·96
	4	Poona	900,621	4,008	2,481	2,826	5,943	2,903	3,491	3,245	1,625	1,858	3,009	3·21	2,580	2·87	2,523	2·73
	5	Sholápur	363,487	2,910	2,326	2,806	3,921	4,012	10,378	8,962	6,600	2,941	4,857	9·21	1,695	2·91	1,808	2·99
Southern Deccan.	6	Belgaum	1,062,259	3,794	2,060	2,245	3,794	2,502	4,042	2,884	2,016	2,178	2,825	2·71	2,500	2·35	2,966	2·84
	7	Dhárwár	964,514	7,420	7,044	8,437	8,662	9,338	29,947	9,902	5,421	4,943	10,057	10·71	4,582	4·37	4,859	4·73
	8	Kánara	361,907	6,591	6,176	7,304	8,106	6,004	15,650	6,716	3,804	3,983	7,021	7·49	4,132	4·06	4,704	4·74
	9	Kaládgi	626,495	3,099	3,408	4,359	5,819	4,093	27,390	4,121	3,037	1,805	6,325	6·90	1,021	2·85	1,896	3·03
Konkan.	10	Kánara	481,940	3,000	3,739	3,207	7,414	3,892	5,015	3,799	2,504	2,025	3,704	6·30	3,171	6·94	3,492	6·28
	11	Ratnágiri	997,599	5,903	5,196	4,102	4,999	4,833	6,054	5,003	3,060	3,329	4,793	4·89	4,456	4·47	4,694	4·26
	12	Kolába	261,649	899	739	677	944	909	1,979	1,247	1,152	1,013	994	3·66	1,212	3·17	1,226	3·48
	13	Bombay City...	773,196	9,245	7,409	7,624	9,377	8,961	12,676	11,876	10,187	11,225	9,968	15·22	12,232	15·91	12,625	16·20
	14	Thána	909,543	2,698	1,954	1,655	3,305	1,716	2,942	2,304	1,807	1,473	1,916	2·26	1,871	2·06	1,947	2·14
Gujarát.	15	Surat	614,106	3,359	2,899	2,986	2,814	1,903	1,711	1,796	1,705	1,404	2,217	2·65	1,717	2·80	1,659	2·71
	16	Broach	259,939	1,026	1,051	945	1,117	413	603	602	765	476	758	2·92	644	1·97	606	1·84
	17	Kaira	604,849	2,028	1,456	998	1,440	1,049	992	1,071	788	922	1,193	1·97	1,241	1·94	1,014	1·58
	18	Panch Mahális ...	253,429	67	85	15	28	20	45	2,618	138	60	338	1·40	100	0·39	28	0·21
	19	Ahmedabad	806,324	3,756	3,002	3,866	4,430	4,120	3,667	4,414	5,131	3,788	3,995	4·97	2,663	3·49	2,464	3·08
Sind.	20	Karáchi	478,658	744	921	799	815	891	1,115	1,042	871	1,100	935	2·19	1,896	3·71	1,316	2·75
	21	Hyderabad	754,624	924	699	469	697	526	871	668	522	465	697	0·93	478	0·63	517	0·69
	22	Thar and Parkar ...	203,344	22	8	14	56	46	124	228	62	159	79	0·43	193	0·96	138	1·71
	23	Shikárpur	810,998	...	471	344	760	205	545	229	254	201	329*	0·43	317	0·37	466	0·55
	24	Upper Sind Frontier ...	134,181	43	54	65	58	38	58	69	60	67	55	0·61	39	0·44	44	0·52

ABSTRACT.

Northern Deccan	4,293,772	13,849	10,039	10,304	13,815	12,191	20,437	14,153	14,180	8,016	13,064	3·14	10,017	2·35	8,728	2·05
Southern Deccan	3,447,764	23,286	19,327	20,441	30,453	21,353	80,812	24,886	15,114	12,008	26,479	6·96	13,006	3·71	14,863	4·21
Konkan	3,482,932	19,131	16,976	17,303	25,939	20,243	27,457	24,319	21,564	21,189	21,141	6·49	22,554	6·76	24,308	6·98
Gujarát	2,957,731	10,236	8,908	7,913	8,872	7,981	7,046	10,839	8,519	6,643	8,369	2·94	6,865	2·24	5,611	1·98
Sind	2,413,823	1,633	2,113	1,691	1,903	1,665	2,702	2,221	1,775	1,992	1,961	0·91	3,081	0·94	2,613	1·08
Total	16,595,414	67,604	60,563	57,940	85,079	63,893	138,426	75,645	60,467	49,796	70,995	4·47	55,522	2·98	56,164	3·41

* Mean for 8 years only.

SECTION III.

GENERAL HISTORY OF VACCINATION.

Changes amongst the Supervising Officers.

1. The changes amongst the supervising officers during 1882-83 (1st April 1882 to 31st March 1883) were as follows :—

(*a*) In the Northern Deccan Registration District Dr. Kiernander, who was acting for Dr. Parker, obtained 6 months' leave on private affairs and handed over charge to Dr. Turnbull on 19th June 1882 before office hours, who in his turn handed it over to Dr. Channer. Dr. Channer had conducted the duties in addition to his own in the Southern Deccan Registration District from 9th August to 1st November 1882 inclusive, since when Dr. Parker, the permanent incumbent, has been in charge.

(*b*) In the Konkan Dr. Kirtikar held charge during the absence of Dr. Clarkson on privilege leave from 17th June to 12th September 1882 inclusive.

(*c*) In the Western Gujarát Circle Dr. Welsh was compelled by ill-health to proceed home, and consequently Dr. McDougall, the Civil Surgeon of Rájkot, had to conduct the duties of the office from 16th October to 26th November 1882 inclusive, since when Dr. Tully has been officiating as Superintendent of Vaccination.

(*d*) In Sind Dr. MacRury, the permanent incumbent, having obtained 18 months' furlough, handed over charge to Dr. Peacocke on 27th November 1882, before office hours.

Strength of the Department.

2. The subjoined table shows in detail the changes in the strength of the department during the years 1881-82 and 1882-83 :—

No.	Districts and Charges.	Area in Square Miles.	Population according to Census of 1881.	Years	Deputy Sanitary Commissioners.	Superintendents of Vaccination.	Inspectors of Sanitation and Vaccination.	Assistant Superintendents of Vaccination.	Clerks and Kárkúns.	Number of Vaccinators. Government. Civil.	Government. Military.	Municipal. Contributed.	Local Fund. Vaccinators.	Local Fund. Kárkúns & Peons.	Native States.	Total.	Number of Persons. Government.	Municipal.	Local Funds.	Native States.	Total.	Total Strength.
1	Northern Deccan Registration District ..	30,843·7	6,75,856	1881-82	1	..	..	..	..	..	..	..	..	..	..	..	11	8	87	..	87	175
				1882-83	1	..	..	..	..	..	..	..	..	..	..	..	11	8	71	1	91	182
2	Southern Deccan Registration District ..	28,751·4	5,01,593	1881-82	1	1	..	..	..	..	..	..	..	..	..	..	9	6	48	32	94	187
				1882-83	1	1	..	..	..	..	..	..	..	..	..	..	9	6	87	32	94	190
3	Konkan Registration District ..	15,337	3,009,477	1881-82	1	..	..	..	..	..	..	..	47	35	30	82	9	6	48	32	94	190
				1882-83	1	..	..	..	..	..	..	..	47	35	30	82	9	6	87	32	94	190
4	Presidency Circle ..	22	773,196	1881-82	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
				1882-83	..	..	..	1	16	..	..	..	41	3	9	53	..	..	41	9	50	120
5	Eastern Gujarát Registration District ..	27,722·672	4,167,314	1881-82	..	..	..	1	16	..	..	..	44	3	9	56	..	..	44	6	50	120
				1882-83	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
6	Western Gujarát Circle	27,256·48	2,930,577	1881-82	1	..	..	..	..	..	..	..	..	..	..	..	9	..	..	..	..	..
				1882-83	1	..	..	..	..	..	..	..	..	..	..	..	9	..	..	..	..	..
7	Sind Registration District ..	84,122·01	2,342,976	1881-82	1	..	..	..	..	..	..	..	37	4	20	61	9	..	..	..	..	..
				1882-83	1	..	..	..	..	..	..	..	37	4	20	61	9	..	37	17	71	143
8	Baroda Circle	8,570	2,185,005	1881-82	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
				1882-83	..	..	..	3	16	..	..	..	41	4	9	54	..	..	41	9	50	104
9	Cutch Circle	6,500	512,044	1881-82	..	..	..	..	..	..	..	..	41	4	9	54	..	..	41	9	50	104
				1882-83	..	..	..	3	16	..	..	..	41	4	9	54	..	..	41	9	50	104
10	Aden	11·6	34,809	1881-82	..	..	..	..	..	..	..	..	37	4	20	61	9	..	37	17	71	143
				1882-83	..	..	..	..	..	..	..	..	37	4	20	61	9	..	37	17	71	143
	Military Stations ..	..	..	1881-82	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
				1882-83	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
				1881-82	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
				1882-83	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Total ..	305,159·265	25,615,526	1881-82	5	2	31	5	32	2	3	40	1	242	144	432	55	32	349	131	483	995
				1882-83	5	2	31	9	32	2	3	39	1	240	146	431	55	31	349	132	480	1,015

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In the Northern Deccan there has been an increase of 3 vaccinators and 3 peons employed in the Poona Collectorate. In the Konkan 1 vaccinator and 1 peon have been added to those in each of the collectorates of Kánara and Kolába. In the Eastern Gujarát the establishment was supplemented by an addition of 1 vaccinator and 1 peon in Pandu Mewas of the Rewa Kántha States. In Sind an additional vaccinator and a peon have been entertained in Khairpur State. On the whole there has been an increase of 7 vaccinators, 16 candidate vaccinators, and 7 peons—in all 30 persons.

Additional grant has been given by the Bombay Municipality during the current year for an extra clerk in the office of the Superintendent of Vaccination, Presidency Circle. The collectorates of Poona, Sátára and Karáchi have each agreed to maintain on the permanent list a candidate vaccinator on a salary of Rs. 5 per month to be attached to the office of the Inspector of Sanitation and Vaccination, for supplying the place of vaccinators absent on leave; and it is hoped that the Local Fund Committees of Khándesh, Násik, Ahmednagar, Ratnágiri, and Panch Maháls will eventually do the same. It is very difficult to get candidates trained for vaccination at a moment's notice The Collector of Ratnágiri, in his letter No. 2773 dated 16th June 1883, has sanctioned the entertainment of a candidate vaccinator from 25th idem.

Work amongst the Civil and Military Population.

3. The following table contrasts the work amongst the civil and military population during the year under report with that for 1881-82:—

Establishment	Persons primarily vaccinated.				Persons revaccinated.				Total Number of Persons operated on.			
	1881-82.	1882-83.	Increase.	Decrease.	1881-82.	1882-83.	Increase.	Decrease.	1881-82.	1882-83.	Increase.	Decrease.
In Civil Life.												
Itinerant	698,100	758,047	59,938 / 8·59	..	51,320	59,947	8,627 / 16·81	..	749,420	817,994	68,565 / 9·15	..
Dispensary	26,813	28,779	1,937 / 7·30	..	2,495	2,435	..	60 / 2·40	29,308	31,205	1,897 / 6·47	..
Total ..	724,922	786,817	61,895 / 8·54	..	53,815	62,382	8,627 / 16·03	60 / 0·11	778,737	849,199	70,462 / 9·05	..
In Army Life.												
Native Army	3,830	4,987	1,157 / 30·21	..	,917	3,581	1,664 / 86·80	..	5,747	8,568	2,821 / 49·09	..
British Army	571	402	..	169 / 29·60	1,037	542	..	495 / 47·73	1,608	944	..	664 / 41·29
Total ..	4,401	5,389	1,157 / 26·29	100 / 2·84	2,954	4,123	1,664 / 56·36	495 / 16·76	7,855	9,512	2,821 / 38·55	664 / 3·63
Total for the whole Presidency	729,323	792,206	63,632 / 8·64	169 / 0·02	56,769	66,505	10,291 / 18·13	555 / 0·98	786,092	858,711	73,283 / 9·33	664 / 0·08

It will be observed that there were 792,206 persons primarily vaccinated and 66,505 re-vaccinated against 729,323 and 56,769 in 1881-82, showing a net increase of 62,883, or 8·62 per cent. under primary vaccinations, as also a net increase of 9,736 or 17·15 per cent. under revaccinations. There was a considerable decrease (41·29 per cent.) under both kinds of operation amongst European troops, the figures being 944 against 1,608 in the preceding year. The rate of increase in revaccinations was 18·13 per cent., more than double that in primary vaccinations. On the whole, there has been an increase of 72,619, or, in other words, for every 100 persons operated on in 1881-82 the numbers for this year have been 109·24.

The number of the surviving newly-born children successfully vaccinated in each collectorate.

4. The following table shows for the last two years the number of surviving newly-born children successfully vaccinated in each collectorate, exclusive of Native States. The birth and death statistics are taken for the calendar year in calculating the number, because infants are generally not vaccinated until 3 months after birth:—

No.	Collectorates.	Years.	Children vaccinated successfully.		Children available for Vaccination.	Births returned as having been registered.	Deaths registered among Children under 1 year.
			Those under 1 year.	Those between 1 and 6 years.			
1	Khándesh	1881-82	21,702	15,370	33,170	39,827	6,657
		1882-83	23,951	18,948	36,000	43,114	7,114
2	Násik	1881-82	13,221	7,389	18,984	23,195	4,211
		1882-83	14,223	7,503	23,034	27,473	4,439
3	Ahmednagar	1881-82	14,893	6,768	20,169	24,313	4,144
		1882-83	18,609	8,528	25,381	29,386	4,005
4	Poona	1881-82	9,929	8,353	18,782	21,578	2,796
		1882-83	11,583	12,356	21,694	24,754	3,069
5	Sholápur	1881-82	11,304	4,054	14,916	17,256	2,340
		1882-83	14,309	7,140	17,326	20,138	2,812
6	Sátára	1881-82	19,158	10,625	32,818	37,334	4,516
		1882-83	18,993	13,577	36,726	41,497	4,771
7	Belgaum	1881-82	10,878	9,251	27,018	31,015	3,997
		1882-83	10,504	12,021	28,384	32,477	4,093
8	Dhárwár	1881-82	9,470	9,134	27,613	33,315	5,702
		1882-83	9,837	11,563	30,445	36,257	5,812
9	Kaládgi	1881-82	8,538	4,208	16,958	19,580	2,622
		1882-83	8,667	6,548	19,775	22,678	2,903
10	Kánara	1881-82	2,007	5,762	10,664	13,264	2,600
		1882-83	2,178	6,391	10,287	12,625	2,338
11	Ratnágiri	1881-82	12,576	8,467	15,065	16,200	1,135
		1882-83	12,334	9,179	19,359	20,622	1,263
12	Kolába	1881-82	5,782	3,773	7,026	8,153	1,127
		1882-83	5,707	3,606	8,021	9,178	1,157
13	Thána	1881-82	11,385	11,224	22,990	26,442	3,452
		1882-83	11,771	12,730	22,424	25,898	3,474
14	Bombay City	1881-82	12,017	4,309	10,102	16,381	6,279
		1882-83	14,940	4,641	9,374	15,094	5,720
15	Surat	1881-82	9,981	5,271	18,049	21,667	3,618
		1882-83	12,296	7,222	18,837	21,833	2,996
16	Broach	1881-82	6,541	1,571	8,049	10,033	1,984
		1882-83	7,221	3,056	8,039	9,342	1,303
17	Kaira	1881-82	16,793	3,361	24,822	30,174	5,352
		1882-83	15,035	6,117	22,757	26,441	3,684
18	Panch Mahals	1881-82	5,916	1,965	7,095	8,226	1,131
		1882-83	4,853	2,983	6,003	6,813	810
19	Ahmedabad	1881-82	21,101	3,666	20,342	24,912	4,570
		1882-83	21,679	4,941	19,623	23,392	3,769
20	Karáchi	1881-82	11,421	4,091	6,448	8,575	2,127
		1882-83	10,577	3,898	7,964	9,871	1,907
21	Hyderabad	1881-82	14,487	7,156	7,482	9,398	1,916
		1882-83	14,228	6,329	6,944	8,767	1,823
22	Thar and Párkar	1881-82	5,328	3,849	4,550	5,492	942
		1882-83	6,742	3,344	4,263	5,061	698
23	Shikárpur	1881-82	24,915	4,254	10,365	12,389	2,024
		1882-83	22,249	3,269	11,714	17,330	5,616
24	Upper Sind Frontier	1881-82	3,137	949	809	938	129
		1882-83	2,998	699	941	1,305	364
	Total	1881-82	282,480	145,210	384,286	459,657	75,371
		1882-83	296,044	117,381	415,415	491,346	75,931

This year the successful vaccinations fell short of the registered births *minus* deaths amongst those under 1 year old in the total number of districts as well as in the first 18, except in Bombay, out of the 24 collectorates, and yet the figures are higher than those for last year in the return of newly-born children, and also there is a greater proportionate number of successful cases in most of the districts, except Sátára, Belgaum, Kolába, Kaira, Panch Mahals, Karáchi, Hyderabad, and Upper Sind Frontier. On the whole, out of 415,415 surviving infants available for vaccination, 296,044, or 71·26 per cent., have been protected.

5. The next table shows the number of persons primarily vaccinated, as also the increase or decrease for each of the last 10 years :—

Primary Vaccinations.

Primarily vaccinated.	Years ended 31st March.										
	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.
Persons	570,025	625,818	671,817	660,629	702,184	670,055	561,969	588,501	643,505	729,223	702,306
Increase	..	55,793	45,999	12,812	41,555	(Decrease.) 32,129	108,086	26,532	56,004	86,018	27,083

Results in Primary Vaccinations.

Out of 792,206 persons primarily vaccinated, 761,745 cases were successful, or 96·15; or only 0·37 per cent. below the highest percentage attained in 1881-82 against 95·95 in 1880-81, 95·11 in 1879-80 and 94·53 in 1878-79, thus showing that there was an improvement in the quality and the quantity of the work performed during the year. The number of unsuccessful cases also compares favourably with those of the previous years, though slightly in excess of that in the preceding year, being 14,232 against 14,061, 14,721, 15,178, and 19,425. Secondary operations, after the failure of the first, were performed on 2,219 persons, and 18,528 persons escaped observation. The following table shows the number of persons primarily vaccinated, and the success among them for the past 10 years :—

	Years ended 31st March.									
	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.
Number of Persons primarily vaccinated.	625,818	671,817	690,029	732,184	670,055	561,969	566,501	642,506	729,323	792,206
Do. successfully.	548,275	635,[illegible]82	660,556	696,148	630,390	531,221	557,840	618,513	702,923	761,745
Percentage of Success	90·81	94·67	95·64	95·35	94·11	94·53	95·11	95·95	96·22	96·15

Revaccinations.

6. The number of persons revaccinated and the success among them for the last 10 years are given below:—

	Years ended 31st March.									
	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.
Number of persons revaccinated.	36,405	60,867	117,714	82,993	80,893	69,177	63,122	62,479	56,769	66,505
Do. successfully.	14,994	45,618	94,468	66,770	62,847	49,830	43,435	45,481	40,675	46,420
Percentage of Success	58·41	75·02	80·26	80·45	75·29	72·03	71·98	72·79	71·65	69·80

Results in Revaccinations.

During the year, 66,505 persons were revaccinated against 56,769 for 1881-82. In 68 instances the revaccinations were repeated, in 7,342 instances the results could not be ascertained, and in 12,811 it failed. The number of successful cases was 46,420, or 69·80 per 100 against 71·65 in the preceding year.

Total Operations.

7. The subjoined table shows the total number of persons primarily vaccinated and revaccinated (as taken together), as also the number of successful cases during each of the last 10 years:—

	Years ended 31st March.									
	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.
Persons operated on	652,223	732,024	808,353	815,177	750,948	631,146	649,623	704,984	786,092	858,711
Do. successfully.	563,169	681,609	755,024	764,918	692,437	561,051	601,275	661,994	744,588	808,165
Percentage of Success	89·41	93·24	93·40	93·83	92·08	92·06	92·87	93·90	94·72	94·11

Results in Total Operations.

It will be seen that the total number of persons operated on were 858,711, and of these 808,165, or 94·11 per cent., were successful. In 1881-82 the percentage was 94·72. There were 2,367 persons operated on more than once; the "unsuccessful" numbered 27,043, and the "unknown" cases were 25,870.

Primary Vaccinations, Revaccinations, and Total Operations by Districts and Circles.

8. The details of the total number of persons operated on for the last two years by Districts and Circles of vaccination, together with the percentages of increase and decrease, are shown on the next page :—

Districts and Circles.	Persons primarily vaccinated.				Persons revaccinated.				Total Number of Persons operated on.			
	1881-82.	1882-83.	Increase.	Decrease.	1881-82.	1882-83.	Increase.	Decrease.	1881-82.	1882-83.	Increase.	Decrease.
Northern Deccan Registration District.	118,584	144,914	26,330 / 22·20	..	2,547	3,077	490 / 18·94	..	121,171	147,991	26,820 / 22·13	..
Southern Deccan Registration District.	127,611	142,486	14,875 / 11·66	..	2,628	3,456	628 / 22·21	..	130,439	145,942	15,503 / 11·89	..
Konkan Registration District.	73,000	80,560	5,554 / 7·40	..	4,419	5,498	1,079 / 24·42	..	79,425	86,058	6,633 / 8·35	..
Presidency Circle.	19,089	22,407	4,318 / 23·87	..	1,406	14,790	13,384 / 951·92	..	19,495	37,197	17,702 / 90·80	..
Eastern Gujarát Registration District.	113,674	124,207	11,533 / 10·24	..	951	2,316	1,365 / 143·53	..	113,625	126,523	12,898 / 11·35	..
Western Gujarát Circle ..	87,993	99,005	1,052 / 1·04	..	2,435	2,564	129 / 5·30	..	100,418	101,569	1,151 / 1·15	..
Sind Registration District	87,715	83,977	..	3,228 / 3·71	28,849	30,058	..	8,753 / 22·76	126,053	114,065	..	11,920 / 9·31
Baroda	67,382	67,678	395 / 0·59	..	235	240	14 / 5·96	..	67,518	67,917	400 / 0·61	..
Cutch	19,936	20,619	1,083 / 5·89	..	86	339	253 / 294·19	..	19,023	20,958	1,936 / 10·18	..
Aden, Muscat, Bassadore, and Bushire.	1,541	964	..	577 / 37·44	28	5	..	23 / 82·14	1,569	969	..	600 / 38·24
British Army	571	402	..	169 / 2·84	1,037	542	..	495 / 47·73	1,608	944	..	664 / 41·29
Native Do.	3,830	4,867	1,157 / 26·29	..	1,917	3,551	1,004 / 80·86	..	5,747	8,568	2,821 / 38·25	..
Total ..	729,329	792,206	66,867 / 9·17	3,984 / 0·55	56,769	66,505	19,996 / 35·48	9,276 / 16·33	786,099	858,711	85,873 / 10·92	13,254 / 1·68

9. In primary vaccinations an increase of 66,867, or 9·17 per cent., is to be observed as having taken place in all the districts and circles except Sind, Aden, &c., and the British Army, which are in the following order:—The Native Army, Presidency Circle, Northern Deccan, Southern Deccan, Eastern Gujarát, Cutch, Konkan, Western Gujarát, and Baroda, where the rate is only 0·59 per 100.

Primary Vaccinations. Increase and Decrease by Districts and Circles.

The decrease in Aden, &c., is owing to only 598 persons having been vaccinated against 1,230 last year in Aden, there being no operations this year in Zanzibar.

10. In revaccinations the increase is distributed over the Presidency Circle, Cutch, Eastern Gujarát, Native Army, Konkan, Southern and Northern Deccan, Baroda, and Western Gujarát, where the rate is 5·30 per 100. The decrease in other districts is 92·70, or 16·33 per cent.—nearly half the rate of increase. These districts stand in the following sequence:—Aden, &c., British Army and Sind, which gives the rate as 22·70 per cent.

Revaccinations. Increase and Decrease by Districts and Circles.

11. In the total operations a decrease of 13,254 is to be observed in Sind, Aden, &c., and British Troops, which has the highest rate of 41·29 per cent., whilst an increase of 85,873 is distributed over all the other Districts and Circles in the following sequence:—The Presidency Circle, Native Army, Northern Deccan, Southern Deccan, Eastern Gujarát, Cutch, Konkan, Western Gujarát, and Baroda, where it is only 0·61 per cent. The net increase is 72,619, or 9·24 per cent.

Total Operations. Increase and Decrease by Districts and Circles.

Districts and Circles.	Years.	Persons primarily vaccinated.								Total Number of Persons operated on. P.—Primary Vaccinations. R.—Revaccinations.		
		Caste.					Age. N.—Number. S.—Successful.			Sex.		Total.
		Christians.	Hindus.	Mussulmans.	Parsis.	Other Castes.	Under 1 year.	Between 1 and 6 years.	All other Ages.	Males.	Females.	
Northern Deccan Registration District.	1891-92	452	101,966	6,571	101	9,025	N. 73,514 / S. 72,395	43,227 / 43,442	1,842 / 1,709	P. 60,021 / R. 8,191	58,562 / 456	118,584 / 8,647
										68,152	59,019	127,171
	1892-93	744	121,983	8,801	99	13,208	N. 89,154 / S. 84,421	56,617 / 55,277	2,143 / 1,973	P. 73,993 / R. 2,438	71,011 / 669	144,954 / 3,107
										76,331	71,680	148,091
Southern Deccan Registration District.	1891-92	268	108,979	9,046	7	9,211	N. 79,771 / S. 69,489	53,414 / 51,058	3,426 / 3,105	P. 65,142 / R. 2,264	62,429 / 444	127,571 / 2,708
										67,406	62,873	130,279
	1892-93	247	120,562	10,349	11	11,316	N. 71,130 / S. 60,974	47,795 / 44,900	4,402 / 3,967	P. 72,791 / R. 2,780	68,796 / 667	142,486 / 3,447
										75,571	70,273	145,933
Konkan Registration District.	1891-92	1,024	66,282	2,496	66	3,380	N. 37,487 / S. 37,074	23,153 / 22,345	4,379 / 4,013	P. 39,192 / R. 2,766	36,934 / 1,681	75,926 / 4,447
										40,960	38,615	79,575
	1892-93	2,012	69,729	4,701	145	3,979	N. 39,432 / S. 39,645	26,020 / 25,521	4,596 / 4,110	P. 41,005 / R. 2,626	39,480 / 1,955	80,485 / 4,581
										44,631	41,435	86,066
Presidency Circle.	1891-92	1,143	10,295	2,660	1,006	1,644	N. 12,708 / S. 12,617	4,660 / 4,304	645 / 528	P. 9,930 / R. 1,928	9,080 / 78	18,969 / 1,606
										10,957	9,158	19,575
	1892-93	1,209	12,288	4,662	1,003	1,978	N. 15,977 / S. 14,969	5,005 / 4,643	1,445 / 1,155	P. 11,412 / R. 11,925	10,985 / 2,965	22,397 / 14,790
										23,337	13,950	37,287
Eastern Gujarat Registration District.	1891-92	90	90,456	9,958	401	6,007	N. 66,234 / S. 77,858	33,344 / 30,966	2,986 / 1,979	P. 56,228 / R. 812	54,423 / 139	112,674 / 951
										59,051	54,574	113,625
	1892-93	115	102,849	10,448	549	9,253	N. 73,079 / S. 70,038	42,972 / 41,433	3,225 / 3,017	P. 68,389 / R. 1,981	59,814 / 457	128,207 / 2,438
										66,373	60,270	126,643
Western Gujarat Circle.	1891-92	12	81,890	10,737	40	8,304	N. 71,191 / S. 66,808	25,301 / 23,278	1,539 / 1,195	P. 49,978 / R. 1,550	48,005 / 695	97,983 / 2,245
										51,528	48,700	100,228
	1892-93	29	90,954	12,392	24	5,800	N. 62,600 / S. 59,009	34,709 / 32,094	1,946 / 1,425	P. 50,719 / R. 1,649	48,186 / 915	98,905 / 2,564
										52,368	49,101	101,469
Sind Registration District.	1891-92	194	14,600	65,709	47	6,263	N. 52,344 / S. 61,195	21,761 / 20,374	2,210 / 2,065	P. 46,979 / R. 17,145	46,206 / 21,636	87,215 / 38,849
										64,024	62,091	126,055
	1892-93	173	13,329	62,105	55	6,713	N. 41,850 / S. 50,550	19,560 / 18,393	2,907 / 2,764	P. 45,199 / R. 12,980	38,089 / 17,198	83,277 / 30,078
										58,179	55,287	114,065
Baroda	1891-92	9	59,560	4,602	95	4,012	N. 55,021 / S. 55,556	11,690 / 11,205	366 / 344	P. 58,516 / R. 223	53,967 / 12	67,383 / 235
										58,739	53,979	67,618
	1892-93	16	57,764	4,948	170	4,701	N. 54,467 / S. 54,747	12,722 / 12,389	469 / 446	P. 60,372 / R. 1,040	53,906 / 39	67,278 / 1,079
										61,412	53,945	67,357

Results.				Excess of Operations over Persons.	Ratio per 100.																		Excess of Operations over Persons.
					Persons primarily vaccinated.									Total Number of Persons operated on.			Results.						
					Caste.					Age.				Sex.									
Successful.	Unsuccessful.	Unknown.	Total.		Christian.	Hindu.	Mussulman.	Parsi.	Other Castes.	Under 1 year.	Between 1 and 6 years.	All other Ages		Males.	Females.	Total.	Successful.	Unsuccessful.	Unknown.	Total.			
118,124 1,736	1,092 559	1,103 302	119,719 2,597	195 1	0·30 0·30	85·96 85·96	2·54 2·54	0·09 0·09	0·11 0·11	61·99 60·96	36·45 38·79	1·56 1·01		50·61 52·37	49·39 47·63	100 100	98·86 67·95	0·73 21·53	1·01 11·67	100·11 100·04		0·11 0·04	
119,860	1,651	1,405	121,967	196										51·29	48·71	100	97·80	1·17	1·03	100·11		0·11	
121,671 1,960	1,297 671	2,152 497	125,120 3,077	213 ...	0·21 ...	84·19 ...	6·11 ...	0·07 ...	9·13 ...	59·43 58·26	39·07 39·14	1·43 1·26		51·09 79·01	48·09 21·09	100 100	97·76 64·97	0·75 32·61	1·49 1·22	100·15 100		0·15 ...	
123,670	1,968	2,564	128,202	211	...	...	...	...	...	...	...	...		51·58	48·42	100	97·68	1·19	1·73	100·14		0·14	
123,543 2,799	1,663 460	3,774 269	127,779 3,529	166 1	0·21 0·21	83·97 83·97	7·09 7·09	0·01 0·01	7·39 7·39	55·46 53·08	41·96 40·46	2·62 2·50		53·08 84·50	46·95 15·79	100 100	96·68 78·58	1·27 14·11	2·17 7·39	100·13 100·04		0·13 0·04	
126,342	2,123	4,043	133,508	169	...	...	...	...	...	...	...	...		51·90	48·09	100	96·68	1·45	2·20	100·13		0·13	
127,427 2,659	1,639 398	3,697 225	132,824 3,436	168 ...	0·25 ...	84·91 ...	7·19 ...	0·01 ...	7·84 ...	55·91 58·29	41·22 40·50	2·83 2·57		51·64 80·70	48·26 19·20	100 100	96·43 70·56	1·26 17·13	2·13 8·31	100·12 100		0·12 ...	
130,086	2,037	3,922	136,260	168	...	...	...	...	...	...	...	...		51·78	48·22	100	95·97	1·43	2·62	100·12		0·12	
71,922 2,205	991 1,039	515 625	73,328 4,469	102 1	2·43 2·43	89·26 89·26	4·66 4·66	0·09 0·09	4·32 4·32	49·97 49·43	44·29 43·29	5·83 5·42		50·92 62·68	49·08 30·91	100 100	89·43 63·48	0·88 24·64	9·69 11·88	100·43 100·02		0·43 0·02	
76,127	2,031	1,040	79,749	203	...	...	...	...	...	...	...	...		51·60	48·40	100	90·43	2·39	7·33	100·15		0·15	
73,276 3,154	1,490 1,034	1,185 714	80,841 5,502	291 4	3·20 3·20	89·56 89·56	5·83 5·83	0·17 0·17	4·24 4·24	49·95 42·97	45·45 44·02	3·66 5·10		50·88 64·90	49·02 35·10	100 100	97·14 67·87	1·39 29·64	1·47 12·99	100·54 100·02		0·34 0·02	
81,430	2,524	1,899	89,853	295	...	...	...	...	...	...	...	...		51·86	48·14	100	94·06	2·19	3·21	100·28		0·28	
16,949 1,302	1,008 255	690 49	18,956 1,606	717 ...	4·05 ...	89·43 ...	21·37 ...	7·22 ...	8·93 ...	79·53 66·43	23·91 27·92	3·06 3·03		49·80 94·45	50·20 5·55	100 100	89·14 74·91	1·04 19·14	4·92 3·48	105·96 100		5·96 ...	
17,501	1,263	659	20,423	717	...	...	...	...	...	...	...	...		53·02	46·98	100	90·09	1·11	4·81	101·69		3·69	
10,730 12,113	873 1,443	1,185 1,337	12,787 14,893	206 ...	1·63 1·63	30·22 30·22	20·36 20·36	6·06 6·06	6·03 6·03	70·86 69·68	23·79 29·71	0·45 0·15		50·93 79·56	49·07 20·05	100 100	89·34 81·91	2·16 9·68	5·39 8·23	101·74 100		1·74 ...	
22,843	2,317	2,522	27,682	206	...	...	...	...	...	...	...	...		63·47	37·53	100	85·22	5·22	6·44	101·65		1·65	
139,137 675	2,235 527	1,797 238	143,142 1,441	468 ...	0·69 ...	84·76 ...	7·68 ...	0·06 ...	7·18 ...	71·61 69·19	26·02 30·06	1·86 1·76		51·69 80·38	48·31 14·62	100 100	96·92 69·85	1·87 24·02	1·53 25·13	100·45 100		0·45 ...	
139,672	2,472	1,946	144,089	468	...	...	...	...	...	...	...	...		51·97	48·03	100	96·23	1·79	1·71	100·41		0·41	
120,966 1,822	2,196 704	2,713 391	125,876 2,917	369 ...	0·00 ...	83·61 ...	9·41 ...	0·44 ...	7·45 ...	61·95 60·09	34·83 36·96	2·60 2·45		51·84 80·48	48·16 19·52	100 100	96·08 52·77	1·48 30·25	1·86 14·89	100·21 100·04		0·21 0·04	
122,788	2,900	2,705	128,393	369	...	...	...	...	...	...	...	...		52·30	47·64	100	95·38	1·98	2·14	100·31		0·31	
91,459 1,637	3,473 577	3,141 627	98,101 2,841	118 ...	0·01 ...	83·53 ...	10·06 ...	0·04 ...	6·41 ...	72·06 69·37	25·73 23·76	1·91 1·84		51·01 69·06	48·99 30·94	100 100	93·27 66·08	2·42 23·70	3·31 9·33	100·13 100		0·12 ...	
93,119	4,043	3,768	100,934	118	...	...	...	...	...	...	...	...		51·31	48·69	100	92·24	2·68	4·95	100·12		0·12	
92,177 1,802	3,471 542	3,479 216	99,127 2,561	122 ...	0·03 ...	81·76 ...	12·53 ...	0·03 ...	5·67 ...	69·76 59·25	27·06 32·41	1·98 1·44		51·29 64·21	48·77 35·09	100 100	93·01 70·31	2·39 21·19	4·47 8·50	100·13 100		0·12 ...	
93,979	4,014	3,697	101,690	122	...	...	...	...	...	...	...	...		51·56	48·44	100	92·03	2·82	5·04	100·12		0·12	
84,104 10,091	1,344 3,283	3,295 4,479	87,979 18,091	276 91	0·21 0·21	17·63 17·63	73·41 73·41	0·05 0·05	7·39 7·39	79·93 1·79·13	19·99 22·93	0·03 3·07		53·75 44·14	46·25 55·86	100 100	96·43 73·07	1·02 14·74	2·55 11·39	100·41 100·20		0·41 0·20	
112,795	7,059	6,650	126,504	449	...	...	...	...	...	...	...	...		50·79	49·21	100	93·44	2·24	3·79	100·26		0·26	
78,906 20,711	1,227 3,373	3,040 4,193	84,313 30,139	236 36	0·20 0·20	16·39 16·39	75·15 75·15	0·07 0·07	7·99 7·99	79·29 1·79·63	20·06 21·78	0·65 2·59		53·93 43·84	46·07 56·16	100 100	93·15 68·90	1·18 17·43	3·67 13·60	100·25 100·13		0·25 0·13	
100,617	4,600	7,200	114,437	272	...	...	...	...	...	...	...	...		51·09	48·91	100	88·23	2·16	6·21	100·23		0·23	
65,113 180	1,302 37	1,067 5	67,582 242	219 7	0·01 0·01	82·67 82·67	6·94 6·94	0·12 0·12	9·16 9·16	1·18·99 1·79·55	17·37 16·80	0·55 0·51		52·49 98·99	47·51 1·01	100 100	96·43 76·00	1·33 21·28	1·92 2·13	100·28 102·99		0·28 2·99	
65,293	1,319	1,092	67,744	226	...	...	...	...	...	...	...	...		52·64	47·36	100	96·34	1·97	1·97	100·31		0·31	
65,405 179	1,310 61	1,017 18	67,732 258	132 ...	0·02 ...	85·26 ...	7·01 ...	0·25 ...	7·04 ...	1·80·31 1·77·92	19·60 19·08	0·08 0·00		53·77 68·85	47·23 11·63	100 100	96·47 68·27	1·27 29·50	1·80 2·23	100·22 100		0·22 ...	
65,584	1,371	1,035	67,990	132	...	...	...	...	...	...	...	...		52·49	47·51	100	96·58	1·43	1·93	100·22		0·22	

Divisions and Circles.	Years.	Persons primarily vaccinated. Caste. Christians.	Hindus.	Musalmáns.	Pársis.	Other Castes.	Age. N.=Number. S.=Successful. Under 1 year.	Between 1 and 6 years.	All other Ages.	Total Number of Persons operated on. P.—Primary Vaccinations. R.—Revaccinations. Sex. Males.	Females.	Total.
Cutch	1881-82	1	14,164	4,749	2	...	N. 11,328 / S. 11,324	6,621 / 6,575	967 / 956	P. 9,652 / R. 47	9,334 / 39	18,986 / 86
										9,699	9,373	19,072
	1882-83	2	15,479	5,136	2	...	N. 12,026 / S. 11,959	7,378 / 7,732	899 / 808	P. 10,310 / R. 302	10,109 / 67	20,419 / 369
										10,612	10,146	20,758
Aden, Bushire, Bassadore and Muscat.	1881-82	15	13	1,309	...	205	N. 113 / S. 100	478 / 416	950 / 886	P. 921 / R. 19	609 / 10	1,541 / 29
										951	618	1,569
	1882-83	9	6	695	4	60	N. 135 / S. 125	355 / 310	474 / 316	P. 645 / R. 4	319 / 1	964 / 5
										649	320	969
British Army	1881-82	273	216	26	2	15	N. 412 / S. 302	100 / 62	19 / 10	P. 227 / R. 102	244 / 135	471 / 1,022
										1,329	379	1,708
	1882-83	190	183	13	1	7	N. 351 / S. 341	43 / 41	8 / 8	P. 217 / R. 425	185 / 117	402 / 542
										642	302	944
Native Army	1881-82	32	2,337	1,241	30	140	N. 2,725 / S. 2,636	652 / 559	487 / 310	P. 2,159 / R. 1,481	1,402 / 306	3,561 / 1,787
										3,640	1,918	5,548
	1882-83	164	2,156	1,470	26	206	N. 2,790 / S. 2,606	600 / 602	187 / 130	P. 2,751 / R. 1,054	2,234 / 487	4,987 / 1,541
										3,805	2,721	6,528
Total for the Bombay Presidency.	1881-82	4,329	354,826	120,091	2,264	47,304	N. 470,660 / S. 462,311	261,826 / 239,312	18,971 / 17,599	P. 275,896 / R. 26,966	253,427 / 26,756	529,323 / 53,722
										302,862	280,183	583,045
	1882-83	5,519	600,206	126,734	2,635	57,112	N. 488,662 / S. 469,594	264,341 / 273,183	22,404 / 20,019	P. 289,654 / R. 41,058	268,102 / 25,447	557,756 / 66,505
										330,712	293,549	624,261

12. The above table specifies, by districts and circles, caste, age, sex and result in primary vaccinations, and sex and result in revaccinations and total operations as contrasted with those in 1881-82, together with the percentages of those particulars. It will be observed that there is an improvement in the work over that of last year as regards numbers, though the percentages in each detail are somewhat lower.

Particulars of vaccine operations by caste, age, sex and result, with their percentages according to Districts and Circles.

13. There were this year primarily vaccinated 5,519 Christians, 600,206 Hindus, 126,734 Musalmáns, 2,635 Pársis, and 57,112 persons of Other Castes, and for all the numbers are higher than last year, the respective percentages being 0·70, 75·76, 16·00, 0·33 and 7·21; the percentages for Hindus and Musalmáns are, however, lower by only 0·91 and 0·47. As regards each district and circle, Christians have a lower percentage by 0·01 in Sind and by 0·04 in Aden, Bushire, Bassadore and Muscat. The percentages for Hindus are lower in all the districts and circles, except the Eastern Gujarát, Cutch, and the British and Native Army; and for Musalmáns they are lower in Sind by 0·26, in Cutch by 0·29, in the Presidency Circle by 1·01 and in the British Army by 1·91. Pársis have a lower percentage in the Northern Deccan and Western Gujarát by 0·02 each, and in the Presidency Circle and Native Army by 0·26 each. The percentages for Other Castes are lower in Aden, &c., and the British Army only.

Caste.

Results.				Excess of Operations over Persons.	Ratio per 100.												Results.				Excess of Operations over Females.
					Persons primarily vaccinated.							Total Number of Persons operated on									
					Caste.					Age.		Sex.									
Successful.	Unsuccessful.	Unknown.	Total.		Christians.	Hindus.	Mussulmans.	Parsis.	Other Castes.	Under 1 year.	Between 1 and 6 years.	All other Ages.	Males.	Females.	Total.		Successful.	Unsuccessful.	Unknown.	Total.	
13,702 77	302 2	12 ..	13,076 86	140 ..	0·01 ..	74·80 ..	25·18 ..	0·01 ..	.. ..	89·97 59·37	24·97 34·44	5·23 5·56	50·97 54·63	49·03 45·35	100 100	99·76 99·53	1·17 1·47	0·07 ..	100·74 100·	0·74 ..
15,779	371	13	16,163	140	..	..	..	..	..	..	..	..	50·99	49·01	100	98·72	1·22	0·06	100·74	0·74
20,479 548	537 16	37 6	20,773 570	134 ..	0·01 ..	75·07 ..	24·91 ..	0·01 ..	.. ..	88·93 57·90	8·76 3·90	2·30 38·20	50·97 50·99	49·03 49·01	100 100	90·23 70·09	8·80 27·43	0·12 1·77	100·75 100·	0·75 ..
20,719	900	49	21,112	134	..	..	..	..	..	..	..	..	51·39	48·61	100	98·86	0·99	0·21	100·73	0·73
1,119 5	319 17	152 5	1,574 27	87 2	0·07 ..	0·13 ..	84·89 ..	.. ..	13·90 ..	7·69 6·49	81·03 37·37	61·65 55·64	69·35 64·29	30·45 35·71	100 100	72·03 28·57	18·56 55·07	9·22 17·36	100·14 101·14	0·14 1·14
1,127	330	141	1,604	35 ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	60·41	39·59	100	71·85	19·18	8·99	100·22	0·22
754 ..	123 2	88 3	965 5	3 ..	0·26 ..	0·63 ..	91·91 ..	0·42 ..	6·77 ..	14·00 12·97	36·85 29·42	49·15 57·61	60·91 60·00	33·09 40·00	100 100	78·22 ..	12·66 40·00	9·12 60·00	100·19 100·	0·19 ..
754	125	91	970	1	..	..	..	..	..	..	..	..	60·93	39·07	100	77·81	12·89	9·59	100·29	0·14
434 267	92 267	58 267	584 1,042	2 ..	47·61 ..	44·21 ..	4·95 ..	0·35 ..	2·88 ..	29·16 61·63	17·51 19·51	10·33 18·86	37·37 61·63	62·78 38·37	100 100	74·31 54·61	8·56 34·91	17·41 10·48	100·28 100·	0·63 0·58
1,021	419	177	1,617	0 ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	76·43	23·57	100	63·49	13·93	11·91	100·56	0·56
250 708	24 308	9 580	283 1,596	74 7	49·50 ..	45·23 ..	2·99 ..	0·25 ..	1·74 ..	87·61 68·92	10·70 19·20	1·69 11·88	53·98 73·43	46·02 26·30	100 100	87·61 61·44	2·49 37·00	9·89 1·47	100·87 99·91	0·87 1·79
725	242	10	977	51 ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	68·93	31·09	100	70·09	22·35	1·06	100·29	0·24
2,179 1,502	208 791	273 16	2,660 2,309	59 55	9·14 ..	63·02 ..	22·48 ..	0·76 ..	2·60 ..	71·15 60·90	16·27 13·92	12·58 9·09	56·61 80·65	43·39 19·35	100 100	82·00 69·02	9·87 30·50	7·13 0·83	100·52 100·76	0·27 2·76
4,042	1,180	289	5,320	70 ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	60·63	39·37	100	75·56	19·42	5·03	101·27	1·27
4,626 2,014	444 1,572	176 23	5,246 3,609	71 39	2·29 ..	63·20 ..	29·77 ..	0·53 ..	4·14 ..	70·00 79·24	13·22 13·27	16·77 7·49	55·25 80·40	44·80 19·60	100 100	82·96 68·24	7·43 47·54	9·53 0·42	101·42 100·	1·42 0·56
6,632	2,016	199	8,850	91 ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	68·24	31·76	100	75·30	22·41	2·29	101·00	1·08
703,825 69,673	74,081 10,165	14,040 6,000	791,946 85,838	2,701 162	0·09 ..	70·07 ..	25·47 ..	0·29 ..	3·98 ..	62·66 43·93	21·72 30·62	2·84 2·27	51·54 54·99	48·46 45·01	100 100	96·52 71·65	1·26 17·63	1·92 10·73	100·32 100·26	0·37 0·26
744,598	84,238	20,131	798,967	2,863	..	..	..	..	..	..	..	..	51·77	48·23	100	94·72	2·72	2·66	100·26	0·90
767,741	74,392	18,809	794,500	2,309	0·79	73·76	16·00	0·38	7·21	61·06	29·97	2·88	51·63	48·37	100	96·15	1·87	2·24	100·29	0·29
40,420	12,511	7,342	60,273	68	..	..	..	..	..	39·13	34·48	2·35	61·74	38·26	100	69·80	19·16	11·04	100·10	0·10
808,161	87,043	25,870	861,078	2,367	..	..	..	..	..	60·45	30·47	2·88	52·45	47·55	100	94·12	2·97	2·91	100·23	0·74

14. The age details are compiled for three stages, *viz.*, those under 1 year, those between 1 and 6 years, and those above 6 years.

Age.

The numbers under each stage primarily vaccinated were respectively 485,661, 284,141 and 22,404 against 479,000, 231,352 and 18,971 during the preceding year. The number of infants successfully vaccinated was 468,594, of children between 1 and 6 years 273,132, and of persons of other ages 20,019. Thus out of every 100 persons primarily vaccinated, there were 61·30 infants, of whom 59·15 were successfully vaccinated against 59·58 in 1880-81, 52·71 in 1879-80, 52·11 in 1878-79, 47·55 in 1877-78, and 42·18 in 1876-77. Thus every year is characterised by a progress in the protection afforded to infants. When compared with the preceding year it is, however, lower by 4·38; but this is only apparent, because the difference between the numbers vaccinated and the successful cases remains unaltered in both years.

15. In para. 91 of the Report for 1878-79 a rate of 31 per thousand of population is laid down as that of infants available for vaccination. At this rate, and on the total population of 25,615,528, there were successfully vaccinated 59·01 per cent. against 58·35 in 1881-82, 49·27 in 1880-81, 39·78 in 1879-80, and 37·89 in 1878-79. The subjoined table shows the number of infants protected out of those available for vaccination (at the rate of 31 per mille of population)

Infants successfully vaccinated as compared with those available for vaccination by Districts and Circles at the rate of 31 per *mille* of population.

by districts and circles, as likewise the protection of children between 1 and 6 years old :—

Districts and Circles.	Population.	Children under 1 Year available for Vaccination at 31 per 1,000.	Years.	Children under 1 Year vaccinated successfully.		Children between 1 and 6 Years vaccinated successfully.	
				Number.	Ratio per 100 on Infants	Number.	Ratio per 100 on Total Vaccinated.
1. Baroda	2,185,005	67,735	1881-82	53,504	78·99	11,305	16·80
			1882-83	52,737	77·86	12,240	18·09
2. Cutch	512,084	15,874	1881-82	11,224	70·71	6,522	34·44
			1882-83	11,939	75·21	7,732	37·50
3. Sind	2,542,976	78,832	1881-82	61,165	77·31	20,874	23·93
			1882-83	58,830	74·63	18,292	21·78
4. Western Gujarát ...	2,920,377	90,532	1881-82	66,894	73·89	23,078	23·76
			1882-83	58,668	64·79	32,084	32·41
5. Presidency Circle ...	773,196	23,969	1881-82	12,017	50·14	4,309	23·82
			1882-83	14,940	62·33	4,641	20·71
6. Northern Deccan ...	4,384,856	135,930	1881-82	72,293	53·18	42,442	35·79
			1882-83	84,421	62·11	55,277	38·14
7. Eastern Gujarát ...	4,162,314	129,032	1881-82	77,853	60·34	29,366	26·06
			1882-83	75,638	58·62	41,433	33·36
8. Southern Deccan ...	5,091,383	157,833	1881-82	68,499	43·35	51,658	40·48
			1882-83	68,804	43·59	64,956	45·59
9. Konkan	3,008,477	93,263	1881-82	37,074	39·73	32,545	43·39
			1882-83	38,645	41·44	35,501	44·67
10. Aden, Bushire, Bas- sadore, and Muscat.	*34,860	1,081	1881-82	100	9·25	419	27·19
			1882-83	125	11·56	313	32·47
11. Native Army ...	.....	...	1881-82	2,336	...	533	13·92
			1882-83	3,506	...	622	12·47
12. British Army ...	.....	...	1881-82	352	...	62	10·81
			1882-83	341	...	41	10·29
Total ...	256,15,528	794,081	1881-82	463,311	58·35	223,313	30·62
			1882-83	468,594	59·01	273,132	34·48

*Of Aden only.

The Southern Deccan holds the same place as last year in this respect, though there is a rise in the percentage of infants protected. Baroda stands first, having a percentage of 77·86 infants protected instead of 78·99 last year. There is a rise in the percentages of infants protected in all the districts and circles, except in Eastern Gujarát, Sind and Western Gujarát, where the fall amounts to 9·10 per cent. The highest rise is observed in the Presidency Circle, to the extent of 12·19 per cent.

Sex.

16. There were 409,054 males and 383,152 females primarily vaccinated. The revaccinated were respectively 41,058 and 25,447, and the totals of persons operated on were 450,112 males and 408,599 females. In primary vaccinations the sex percentages are respectively 51·63 and 48·37 against 51·54 and 48·46 last year; in revaccinations they are 61·74 and 38·26 against 54·59 and 45·41; and in total operations they are 52·42 and 47·58 against 51·77 and 48·23.

Results.

17. There is a slight fall in the percentage of "successful", owing to there being more "unsuccessful" and "unknown" cases. In primary vaccinations there were 761,745, or 96·15 per cent., successful; 14,232, or 1·51 per cent., unsuccessful; and 18,528, or 2·34 per cent., unknown. Secondary operations amounted to 2,299 or 0·29 per cent. The percentages for 1881-82 were respectively 96·52, 1·56, 1·92 and 0·37.

There is a fall in successful revaccinations, but it amounts to only 1·85 per cent. The three kinds of result afforded the respective percentages of 69·80, 19·16 and 11·04 against 71·65, 17·62 and 10·73 in the previous year. In 68 cases, or 0·10 per cent., the revaccinations were repeated; last year they were repeated in 162 instances.

Of total operations 308,165, or 94·12 per cent., were successful; 27,043, or 2·87 per cent., were unsuccessful; and 25,870, or 3·01, were unknown. Last year the percentages were respectively 94·72, 2·72 and 2·56. The excess of operations over persons was 2,367, or 0·28 per 100, against 2,863, or 0·36 per cent., in 1881-82. In calculating the percentages of unsuccessful cases these numbers have been excluded.

Percentages of success reviewed by Districts and Circles.

18. The following table shows by districts and circles the percentages of success in primary vaccinations and revaccinations contrasted with those for the previous year :—

No.	Districts and Circles.	Percentages of Success in Primary Vaccinations.		Percentages of Success in Revaccinations.	
		1882-83.	1881-82.	1882-83.	1881-82.
1	Cutch Circle	99·32	98·76	70·80	89·53
2	Northern Deccan Registration District...	97·76	98·26	64·97	67·19
3	Konkan Registration District	97·14	98·43	57·37	63·48
4	British Army	97·01	76·01	61·44	56·61
5	Eastern Gujarát Registration District ...	96·68	96·92	52·77	44·95
6	Baroda Circle	96·67	96·83	68·27	76·60
7	Southern Deccan Registration District...	96·45	96·66	76·36	78·50
8	Sind Registration District	95·15	96·43	68·90	73·87
9	Western Gujarát Circle	93·10	93·37	70·31	66·98
10	Presidency Circle	92·54	93·14	81·91	78·38
11	Native Army	88·99	83·00	56·24	60·67
12	Aden, &c.	78·22	72·62	...	28·57
	Average for the whole Presidency ...	96·15	96·52	69·80	71·65

In the "successful" primary vaccinations the percentages are lower than last year in Konkan, Sind, Presidency Circle, Northern Deccan, Western Gujárat and Baroda, owing to there being more "unsuccessful" and "unknown" cases than last year.

Rate per mille of Population protected by Primary Vaccinations by Districts and Circles.

19. The number of persons primarily vaccinated successfully out of every 1,000 by districts and circles, as compared with 1881-82, is shown in the table below :—

No.	Districts and Circles.	Population of Registration Districts and Circles according to the Census of 1881.	Total Number of Persons primarily vaccinated successfully.		Number of Primary successful Vaccinations per 1,000 of Population.	
			1882-83.	1881-82.	1882-83.	1881-82.
1	Cutch	512,084	20,479	18,702	39·99	36·52
2	Northern Deccan Registration District	4,384,856	141,671	116,524	32·31	26·57
3	Western Gujarát Circle	2,920,377	92,177	91,488	31·56	31·33
4	Sind Registration District	2,542,976	79,906	84,104	31·42	33·07
5	Baroda	2,185,005	65,423	65,153	29·94	29·36
6	Eastern Gujarát Registration District.	4,162,314	120,088	109,197	28·85	26·23
7	Southern Deccan Registration District	5,091,383	137,427	123,342	26·99	24·22
8	Presidency Circle	773,196	20,736	16,849	26·82	21·79
9	Konkan Registration District ...	3,008,477	78,256	73,832	26·01	24·54
10	Aden, &c.	34,860	754	1,119	21·06	32·10
11	British Army	...	390	434	...	...
12	Native Army	...	4,438	3,179	...	...
	Total ...	25,615,528	761,745	703,923	29·74	27·48
	In British Territory	16,503,663	493,264	443,940	29·89	26·90
	In Native States	9,111,865	268,481	259,983	29·46	28·53

The rate of protection is higher than last year in all the districts and circles, except in Sind and Aden. It is lowest in Konkan and Aden, &c. In British and Native territory it is respectively 29·89 and 29·46 against 26·90 and 28·53 per mille of population in the previous year. On the whole, 29·74 persons of all ages per every 1,000 of population, against 27·54 last year, 24·60 in 1880-81, and 22·26 in 1879-80, were primarily vaccinated successfully.

Vaccinations by Establishments.

20. The progress of vaccination by different establishments will be seen from the subjoined table:—

Establishments.	Persons primarily vaccinated.				Persons revaccinated.				Total Number of Persons operated on.			
	1881-82.	1882-83.	Increase.	Decrease.	1881-82.	1882-83.	Increase.	Decrease.	1881-82.	1882-83.	Increase.	Decrease.
2 Government Vaccinators	5,563	5,560	..	290 / 5·34	46	94	46 / 95·83	..	5,611	5,560	..	251 / 4·47
23 Municipal	54,720	65,256	10,492 / 19·15	..	7,170	22,716	15,546 / 216·82	..	61,890	87,984	26,038 / 42·05	..
1 Cantonment	1,060	1,471	411 / 38·77	..	143	349	207 / 130·06	..	1,203	1,812	609 / 50·46	..
248 Local Fund	370,009	410,823	40,814 / 10·73	..	20,326	21,612	1,286 / 6·32	7,624 / 26·43	418,944	451,434	32,490 / 7·94	..
146 Native States	257,732	266,260	8,528 / 3·31	..	4,731	5,193	462 / 9·79	..	262,473	271,465	8,990 / 3·42	..
156 Dispensaries	26,813	29,770	2,957 / 7·70	..	2,453	2,453	..	60 / 2·40	29,209	31,208	1,997 / 6·47	..
British Army	571	402	..	169 / 29·60	1,067	542	..	525 / 47·73	1,638	944	..	694 / 41·99
Native Army	8,830	8,997	1,157 / 30·21	..	1,302	2,561	1,264 / 99·00	..	5,747	8,558	2,811 / 49·03	..
Total	729,325	798,329	63,549 / 8·66	459 / 0·06	36,749	56,506	17,815 / 31·56	8,179 / 14·41	786,022	858,719	73,554 / 9·35	945 / 0·12

In primary vaccinations an increase is observed under all establishments, except the Government establishment and the British Army, amounting to 63,349, or 8·69 per cent., the maximum rate of increase being 38·77 per cent. under cantonment establishment. In revaccinations there is an increase of 17,915, or 31·56 per cent. under Government, Municipal, Cantonment, Native States and Native Army, but there is a decrease of 8,179 in others, or 14·41 per cent. Taking the two kinds of operations together, there is an increase of 73,534, or 9·35 per cent., and a decrease of 915, or 0·12 per cent., in the work of the Cantonment vaccinator and in the British Army.

21. The results in primary vaccinations, revaccinations, and total operations, as analysed by establishments, are as under:—

Results in Vaccine Operations by Establishments.

Establishment.	Year.	Results in Primary Vaccinations.					Results in Revaccinations.					Results in Total Operations.				
		Successful.	Unsuccessful.	Unknown.	Total.	% Excess Operations.	Successful.	Unsuccessful.	Unknown.	Total.	% Excess Operations.	Successful.	Unsuccessful.	Unknown.	Total.	% Excess Operations.
2 Government Vaccinators	1881-82	5,497	22	44	5,563	..	46	2	..	48	..	5,543	24	44	5,611	..
	1882-83	5,252	17	24	5,293	..	94	..	..	94	..	5,339	17	24	5,380	..
23 Municipal Vaccinators	1881-82	59,226	1,700	1,164	62,090	730	4,968	1,430	807	7,205	6	57,192	3,110	2,043	67,464	730
	1882-83	61,803	1,037	2,220	65,077	468	17,650	2,563	2,304	22,717	5	79,453	4,330	4,622	88,304	479
1 Cantonment Vaccinators	1881-82	1,060	..	..	1,060	..	113	23	..	143	..	1,173	23	..	1,203	..
	1882-83	1,455	16	..	1,471	1·41	338	207	2	547	3	1,698	118	..	1,812	..
248 Local Fund Vaccinators	1881-82	360,913	4,847	5,719	369,079	1,987	20,172	6,006	4,545	30,723	37	396,691	10,459	10,260	418,253	1,124
	1882-83	407,605	4,827	8,414	420,876	1,004	21,233	6,136	4,251	31,620	39	435,560	10,963	12,665	454,496	1,043
146 Native States Vaccinators	1881-82	249,582	6,259	5,594	261,435	646	3,376	929	394	4,779	6	248,945	7,188	5,988	262,147	674
	1882-83	254,072	6,059	6,749	266,879	606	3,780	1,061	339	5,180	..	257,852	7,120	7,088	272,059	606
156 Dispensaries	1881-82	25,600	1,188	745	26,973	160	1,710	808	196	2,498	9	26,760	1,731	902	29,473	165
	1882-83	26,733	1,186	904	28,823	80	1,965	1,009	113	3,087	6	27,790	2,257	1,267	31,295	67
British Army	1881-82	534	32	85	571	3	587	377	83	1,045	6	1,021	419	177	1,617	9
	1882-83	390	34	7	426	24	332	206	8	546	7	722	240	15	972	31
Native Army	1881-82	3,179	324	272	3,775	73	1,185	791	18	1,979	13	4,347	1,109	289	5,754	73
	1882-83	4,480	444	136	5,060	73	2,014	1,570	13	3,601	25	6,494	2,046	201	8,660	91
Total for the Bombay Presidency	1881-82	705,592	14,901	14,040	732,624	2,701	30,675	10,564	6,044	58,281	180	744,599	28,263	20,151	793,033	2,802
	1882-83	761,745	14,332	18,454	794,532	2,256	46,436	12,841	7,342	66,679	90	808,180	27,043	25,879	861,679	2,367

In primary vaccinations the number of successful cases was more than last year for each establishment except the Government and the British Army, though the number of unsuccessful cases was also more; it was, however, less in the Government, Municipalities, Native States, and the British Army. A fall in the number of unsuccessful cases indicates an improvement in the work performed.

The number of unknown cases outnumber the unsuccessful in all except the Cantonment, Dispensary, and the British and Native Army, and are more than last year in all establishments, except in Government and the Army generally.

In revaccinations the successful cases are also more than last year in all establishments, except the Local Fund, Dispensary and the British Army, owing to the greater number of revaccinations, but among the municipal vaccinators they were nearly four times the number in 1881-82. The intensity of the protective power of primary vaccine operations may be judged by the unsuccessful revaccinations. The unsuccessful cases are also more, Government and British Army excepted, and the "unknown" are more than in 1881-82 on the whole and also in Municipalities, Cantonment, and Dispensaries.

Percentages of success reviewed by Establishments.

22. The percentages of successful cases in each kind of operation by establishments are given below :—

Establishments.		Government.	Municipal.	Cantonment.	Local Fund.	Native States.	Dispensaries.	British Army.	Native Army.	For the whole Presidency.
In Primary Vaccinations.										
Percentage of success	1881-82	98·81	95·80	100	97·60	95·06	93·42	76·01	83·00	96·52
	1882-83	99·22	94·78	98·57	97·10	95·42	92·92	97·01	88·99	96·15
In revaccinations.										
Percentage of success	1881-82	95·83	68·45	77·93	73·33	71·51	68·54	56·61	60·67	71·65
	1882-83	100	77·70	69·59	67·17	73·18	43·74	61·44	56·24	69·80

In primary vaccinations the percentages are higher than in the preceding year in Government and the British and Native Army only. The highest percentage is 99·22 in Government and the lowest is 88·99 in the Native Army. The next highest is 98·57 in Cantonment and the next lowest is 92·92 in Dispensaries. In revaccinations the lowest percentage is 43·74 in Dispensaries and the highest is 100 under Government.

Work of Establishments by Districts and Circles.

23. The work of the different establishments by districts and circles is as follows :—

Work of Government Vaccinators.

24. There are 2 vaccinators for the cantonments of Rájkot and Deesa, paid from Provincial Funds, who work under the Superintendent of Vaccination, Western Gujarát Circle. Half the cost of vaccination in Deesa is borne by the Cantonment Committee. Besides these 2, there are 3 others under the Station Staff Surgeons for the military stations of Mhow, Neemuch and Nasirabad, paid from "Military Funds". Their work is included under the head of Native Army and Camp Followers. The Rájkot and Deesa vaccinators work among a population of 126,019 souls in an area of 271·23 square miles. There were 5,266 persons primarily vaccinated and 94 revaccinated, against 5,563 and 48 in the previous year. The successful cases were respectively 5,225 and 94, which give the percentages of 99·22 and 100: so, taking the two operations together, 42·21 per thousand of population were protected against 43·99 last year. The total cost was Rs. 504. The cost of each successful case was anna 1 and pies 6, or 1 pie more than last year. In primary vaccinations the unsuccessful cases were 17 and of unknown 24. In revaccinations the unsuccessful and the unknown were none. No person was operated on more than once. Each vaccinator averaged 2,680 persons.

Work of Cantonment Vaccinators.

25. There is only 1 vaccinator for the cantonments of Poona and Kirkee, which have an area of 4 square miles and a population of 37,381. His work is supervised by the Deputy Sanitary Commissioner, Northern Deccan Registration District. He was aided by a temporary vaccinator and the two Poona City municipal vaccinators since February last, owing to the prevalence of small-pox. He primarily vaccinated 1,471 and revaccinated 342 persons. Last year these numbers were respectively 1,060 and 145. In primary vaccinations 1,450, or 98·57 per cent., were successful, and in revaccinations 238, or 69·59 per cent., were successful. The rate of protection per mille of population was 45·16. Last year it was 31·38. The total cost was Rs. 396, annas 7, and pies 10, or annas 3 and pies 9 per each successful case: last year it was annas 2-9. There were 16 unsuccessful

and 5 unknown cases under primary vaccinations, and among revaccinations they were respectively 12 and 2. None were operated on more than once.

Work of Municipal Vaccinators.

26. The following table gives the progress of vaccination by districts and circles under municipal vaccinators :—

Districts and Circles.	Persons primarily vaccinated.				Persons revaccinated.				Total Number of Persons operated on.			
	1881-82.	1882-83.	Increase.	Decrease.	1881-82.	1882-83.	Increase.	Decrease.	1881-82.	1882-83.	Increase.	Decrease.
Northern Deccan Registration District	10,351	11,592	1,241	...	785	1,272	487	...	11,136	12,864	1,728	...
Southern Deccan Registration District	5,715	6,562	847	...	307	293	...	14	6,022	6,855	833	...
Konkan Registration District .	2,737	3,218	481	...	736	1,164	428	...	3,473	4,382	909	...
Presidency Circle	17,949	22,403	4,454	...	920	14,452	13,532	...	18,869	36,855	17,986	...
Eastern Gujarát Registration District	8,371	11,543	3,172	...	181	557	376	...	8,552	12,100	3,548	...
Sind Registration District ...	8,373	9,292	919	...	4,224	4,973	749	...	12,597	14,265	1,668	...
Aden	1,230	598	...	632	17	5	...	12	1,247	603	...	644
Total ...	54,726	65,208	11,114	632	7,170	22,716	15,572	26	61,896	87,924	26,672	644

In primary vaccinations a decrease of 632 is observed in Aden only. For the remaining districts there is a collective increase of 11,114. In revaccinations there is a decrease of 26 only in Aden and Southern Deccan and an increase of 15,572 in other districts, of which in the Presidency Circle alone there is an increase of 13,532, because many had recourse to revaccinations owing to the prevalence of small-pox in an epidemic form. On the whole, taking the two operations together, there is a net increase of 26,028. The Khed Municipality of the Poona Collectorate has discontinued its own vaccinator. There are, in all, 38 vaccinators, or 1 less than last year, who worked amongst a population of 1,815,663 over an area of 1,846 square miles. They returned 65,208 primary vaccinations and 22,716 revaccinations, of which there were, respectively, 61,802 or 94·78, and 17,650 or 77·70 per cent. successful. The percentages of success attained are equal to 43·76 per mille of population against 31·47 last year. The total cost was Rs. 24,595, annas 15 and pies 4½, equal to annas 4 and pies 11, or anna 1 and pies 2 less than in the preceding year, per each successful case. The unsuccessful and unknown were, respectively, 1,637 and 2,238 and 2,683 and 2,384 under each kind of operation. There were 469 secondary operations, and in only 1 case the revaccination was repeated. Each vaccinator, on an average, operated on 2,314 persons. Vaccination is carried on by the medical officers of dispensaries in such towns as have no vaccinators of their own, and where there is no dispensary there the rural vaccinator performs it. It would be well if all towns having a population of 10,000 had special vaccinators, as the dispensary medical officers cannot devote sufficient time to the details of the work. It should at least be arranged that each town circle which compiles birth and death returns should have a vaccinator.

Necessity for Special Vaccinators in Towns having a population of 10,000.

Districts.	Persons primarily vaccinated.				Persons revaccinated.				Total Number of Persons operated on.			
	1881-82.	1882-83.	Increase.	Decrease.	1881-82.	1882-83.	Increase.	Decrease.	1881-82.	1882-83.	Increase.	Decrease.
Northern Deccan Registration District .	100,104	123,305	23,203	..	1,034	719	..	315	101,138	124,024	22,888	..
Southern Deccan Registration District ..	76,873	87,362	10,492	..	1,620	2,278	658	..	78,493	89,643	11,150	..
Konkan Registration District	60,073	64,056	3,983	..	2,914	2,320	..	594	62,987	66,376	3,389	..
Eastern Gujarát Registration District ..	67,465	75,675	8,210	..	598	1,620	1,020	..	68,055	77,295	9,240	..
Sind Registration District..	74,495	69,421	..	5,074	33,078	24,675	..	8,403	107,573	94,096	..	13,477
Total ..	379,008	419,822	45,888	5,074	39,236	31,612	1,688	9,312	418,244	451,434	46,667	13,477

Work of Local Fund Vaccinators.

27. The above table shows the work of Local Fund vaccinators for each of the five registration districts. There is an increase in the primary vaccinations and total operations in all the districts, except Sind, of 45,888 and 46,667 respectively. The decrease in Sind is owing to a great number of infants having died of malarious fevers and cold. In revaccinations there is a decrease of 9,312 in 3 districts, and an increase of 1,688 in the Southern Deccan and Eastern Gujarát together. This year there were 248 vaccinators against 242 in the previous year, as 3 additional vaccinators in Poona, 1

more in Kánara, and an additional 1 in the Kolába Collectorate were employed during the year; and 1 vaccinator, having been abolished from the Khed Municipality, was brought on the Local Fund establishment. There are now only 5 vaccinators (1 in Broach and 4 in Karáchi) who have more than one rural circle to attend to. It is hoped that the Collectors of Broach and Karáchi will not find it difficult to make provision for the additional vaccinators, more especially as they shall have to contribute nothing hereafter towards the pension fund of the vaccinators, as per Accountant General's Circular No. $\frac{L.F.}{17}$, dated 2nd June 1883. The Local Fund vaccinators worked over an area of 124,129·81 square miles and amongst a population of 14,658,401. They primarily vaccinated 419,822 and revaccinated 31,612 persons. The number primarily vaccinated successfully was 407,635, or 97·10 per cent., and those revaccinated successfully were 21,233, or 67·17 per cent. The rate of protection per mille of population was 29·26 against 27·31 last year. The total cost amounted to Rs. 77,787-6-5. Each successful case cost annas 2 and pies 11, the same as last year. The unsuccessful in each kind of operations were respectively 4,827 and 6,136, and the unknown were 8,414 and 4,281. There were 1,054 secondary operations and 38 repetitions of revaccinations. Each vaccinator averaged 1,820 persons.

Districts and Circles.	Persons primarily vaccinated.			Persons revaccinated.				Total Number of Persons operated on.			
	1881-82.	1882-83.	Increase.	1881-82.	1882-83.	Increase.	Decrease.	1881-82	1882-83.	Increase.	Decrease.
Northern Deccan Registration District	1,684	2,038	354	464	554	90	...	2,148	2,592	444	...
Southern Deccan Registration District	39,041	41,859	2,818	449	481	32	...	39,490	42,340	2,850	...
Konkan Registration District...	8,888	9,677	789	671	1,120	449	...	9,559	10,797	1,238	...
Eastern Gujarát Registration District	32,355	33,259	904	102	87	...	15	32,457	33,346	889	...
Western Gujarát Circle ...	90,485	92,045	1,560	2,272	2,349	77	..	92,757	94,394	1,637	..
Sind Registration District ...	2,590	2,850	260	442	4	...	438	3,032	2,854	...	178
Baroda	63,773	63,933	160	235	249	14	...	64,008	64,182	174	...
Cutch	18,936	20,619	1,683	86	339	253	...	19,022	20,958	1,936	...
Total ...	257,752	266,280	8,528	4,721	5,183	915	453	262,473	271,463	9,168	178

Work of Native State Vaccinators.

28. The above table shows the work of Native State vaccinators in 5 districts and 3 circles. There is a general increase in primary vaccinations of 8,528. In revaccinations there is a decrease of only 453 in the Eastern Gujarát and Sind. This decrease is less than the increase, which amounts to 915. There is an increase of 9,168 in total operations in all the districts but Sind, which shows a decrease of only 178. There were 146 vaccinators, or 2 more than last year, as 1 vaccinator has been entertained in Pandu Mewas and an additional one in Khairpur State. They worked over an area of 80,579·625 square miles and amongst a population of 8,978,074. The numbers primarily vaccinated were 266,280, and 5,183 were revaccinated. Of these the successes were 254,072 and 3,793 respectively, or 95·42 and 73·18 per cent. The unsuccessful and unknown in primary vaccinations were 6,059 and 6,745, and 1,051 and 339 in revaccinations. There were 596 secondary operations, and none were revaccinated more than once. Out of every 1,000 of population, 28·72 were successfully operated on, against 27·84 last year. The total cost amounted to Rs. 51,425-14-1. This gives annas 3 and pies 2 per each successful case, or 1 pie less than last year. The average number of persons operated on by each vaccinator was 1,859. Additional vaccinators are required for each of the States of Sávantvádi, Sángli Táluka, Gad Hinglaj, Panála, Kolhápur Petha, Lunávádá, Sunth, Kadána, Pálanpur (2), and Khairpur.

States that require additional Vaccinators.

Work of Dispensary Officers.

29. There were 156 dispensaries, or 5 less than in the preceding year, in which vaccination was carried on. The following table shows the progress of vaccination in dispensaries by each district and circle :—

Districts and Circles.	Persons primarily vaccinated.				Persons revaccinated.				Total Number of Persons operated on.			
	1881-82.	1882-83.	Increase.	Decrease.	1881-82.	1882-83.	Increase.	Decrease.	1881-82.	1882-83.	Increase.	Decrease.
Northern Deccan Registration District	5,307	6,503	1,171	..	129	150	21	..	5,546	6,653	1,107	..
Southern Deccan Registration District	5,362	6,700	718	..	402	404	..	48	6,434	7,104	670	..
Konkan Registration District	6,309	9,009	201	..	98	104	706	..	8,406	8,503	1,097	..
Presidency Circle	140	4	..	136	450	239	..	148	626	243	..	284
Eastern Gujarát Registration District	4,433	5,720	..	713	79	82	..	26	4,561	5,782	..	779
Western Gujarát Circle	1,555	1,594	..	241	115	121	6	..	2,650	1,615	..	235
Sind Registration District	1,757	2,434	677	..	1,696	436	..	660	2,453	2,850	..	2
Baroda	2,519	2,745	225	..	..	..	..	..	2,519	2,745	225	..
Rewákánta, Rámadurg and Mussal	311	306	55	..	11	..	..	11	322	306	44	..
Total	28,813	28,779	3,067	1,130	2,495	2,435	833	893	29,308	31,305	5,196	1,301

A decrease of 1,130 is observed in the Eastern Gujarát, Western Gujarát and Presidency circles in primary vaccinations. The decrease in Eastern Gujarát is owing to the vaccination work in 10 out of 23 dispensary towns being entrusted to táluka vaccinators, with a proviso that the medical officers of these dispensaries are to render their assistance to vaccinators during the small-pox epidemics. In Western Gujarát it is attributable to lack of zeal and laziness on the part of the medical officers, who do not consider it a part of their duty to vaccinate. In the Presidency Circle no vaccinations were, this year, carried on in the Lunatic Asylum at Colába. There is an increase of 3,087 in other districts. In revaccinations there is an increase of 833 in Northern Deccan, Konkan and Western Gujarát and a decrease of 893 in the other districts. In Sind there were no revaccinations this year in the Mitti and Mehar dispensaries, whilst last year as many as 950 persons were revaccinatad. On the whole there is a net increase of 1,897 over the work of last year. There were 28,770 persons primarily vaccinated and 2,435 revaccinated. The respective numbers of successful cases were 26,733 and 1,065. The perceutages of success were 92·92 and 43·74 against 93·42 and 68·54 in 1881-82. The unsuccessful and unknown were 1,198 and 924 in primary vaccinations, and 1,059 and 313 in revaccinations. The number of secondary operations was 85. Two persons were revaccinated more than once.

Work performed in the Army generally.

30. The following table shows details of vaccination in the Army generally and amongst camp followers :—

		Primary Vaccinations.																	
		1	2						3			4					5	6
		Sex.	Caste.						Age.			Results.						
												Successful.			Unsuccessful and doubtful.	Unknown.	Total.	Above 1st of Operations over 1 Person.
		Males.	Females.	Christians.	Hindus.	Musalmans.	Parsis.	Other Castes.	Under 1 year.	Between 1 and 6 years.	Above 6 years.	Under 1 year.	Above 1 and 6 years.	Total of all ages.				
British Army.																		
Regiments	1881-82	139	104	223	..	..	..	..	223	..	..	170	..	170	19	37	226	3
	1882-83	102	58	160	2	..	..	..	160	7	1	160	7	168	32	..	200	24
Camp Followers	Fol- 1881-82	208	140	50	253	45	..	15	189	120	80	182	62	304	32	11	348	..
	1882-83	114	99	6	180	12	1	7	208	36	7	161	34	202	9	2	213	..
Total	1881-82	327	244	273	253	45	2	15	412	120	80	352	62	474	51	48	574	3
	1882-83	216	157	166	182	12	1	7	368	43	8	321	41	370	41	2	413	24
Native Army.																		
Regiments	1881-82	601	467	39	723	276	..	30	669	256	143	631	259	963	102	51	1,065	17
	1882-83	1,111	802	46	1,383	466	..	58	1,350	312	206	1,028	297	1,270	223	7	1,500	46
Camp Followers	Fol- 1881-82	1,567	1,195	63	1,630	502	50	110	2,056	367	333	1,766	294	2,317	396	2082	2,795	2
	1882-83	1,641	1,262	118	1,761	657	36	150	2,440	345	329	2,313	325	2,659	221	169	3,049	55
Total	1881-82	2,168	1,662	92	2,357	1,043	50	140	2,725	623	476	2,397	553	3,179	498	273	3,850	19
	1882-83	2,752	2,064	164	3,144	1,123	36	208	3,790	657	535	3,341	622	4,429	444	176	5,049	71

		Revaccinations.							Percentages of successful Cases.	
		7	8			9	10		11	
		Sex.	Result.			Total.	Excess of Operations over Persons.		In Primary Vaccinations.	In Revaccinations.
		Males.	Females.	Successful.	Unsuccessful and doubtful.	Unknown.				
British Army.										
Regiments ...	1881-82 ...	866	121	537	302	89	988	1	76·23	54·41
	1882-83 ...	244	56	191	110	6	307	7	95·92	63·67
Camp Followers.	1881-82 ...	36	14	50	5	...	55	5	75·86	100
	1882-83 ...	181	61	142	98	2	242	...	98·06	58·68
Total ...	1881-82 ...	902	135	587	307	89	1,043	6	76·01	56·71
	1882-83 ...	425	117	333	208	8	549	7	97·01	61·44
Native Army.										
Regiments ...	1881-82 ...	1,577	250	1,096	771	13	1,880	53	90·07	59·99
	1882-83 ...	2,625	392	1,694	1,328	15	3,037	20	90·63	56·15
Camp Followers.	1881-82 ...	84	6	67	20	3	90	...	80·27	74·44
	1882-83 ...	469	95	320	244	...	564	...	87·93	56·73
Total ...	1881-82 ...	1,661	256	1,163	791	16	1,970	53	83·00	60·67
	1882-83 ...	3,094	487	2,014	1,572	15	3,601	20	88·99	56·24

European Troops.

31. Amongst European troops the number of persons primarily vaccinated was 402, and in 390 cases, or 97·01 per cent., the operation was successful. The unsuccessful and unknown were 34 and 2 respectively: there were 24 secondary operations. The revaccinations were 542, of which 333, or 61·44, were successful, whilst 208 were unsuccessful and 8 were unknown. Seven persons were revaccinated more than once. Last year there were 571 persons primarily vaccinated and 1,037 were revaccinated, so there is a decrease of 664 persons.

Native Troops.

32. In the Native Army the primarily vaccinated numbered 4,987 and the revaccinated 3,581. In primary vaccinations there is an increase of 1,157, and in revaccinations of 1,664. The number of persons primarily vaccinated successfully was 4,438, or 88·99 per cent.; this is 5·99 more than in the preceding year. In revaccinations there were 2,014, or 56·24 per cent., successful. The unsuccessful and unknown cases numbered respectively 444 and 176 in primary vaccinations, and 1,572 and 15 in revaccinations. Secondary operations were 71, and 20 persons were revaccinated more than once. The work performed by vaccinators in the military stations of Mhow, Neemuch and Nasirabad is included, as usual, in that for Camp Followers.

Average Number of Operations per each kind of Establishment.

33. The average number of persons operated on by different establishments is specified below for the years 1881-82 and 1882-83:—

No.	Establishments.	Average Number of Persons operated on.	
		1881-82	1882-83.
1	2 Government Vaccinators	2,805	2,680
2	38 Municipal do.	1,587	2,314
3	1 Cantonment do.	1,205	1,813
4	248 Local Fund do.	1,728	1,820
5	146 Native State do.	1,823	1,859
6	435 For the whole Presidency	1,751	1,880

There is an increase under all establishments, except under Government vaccinators, whose average work amounts to 2,680 instead of 2,805 persons.

Average Number of Operations per Vaccinator by Districts and Circles.

34. The subjoined table indicates the averages by districts and circles :—

No.	Districts and Circles.	Average Number of Persons vaccinated by each Vaccinator.		Names of Deputy Sanitary Commissioners and Superintendents.
		1881-82.	1882-83.	
1	Presidency Circle	2,339	4,607	Dr. Ananta Chandroba.
2	Western Gujarát Circle ...	2,288	2,320	Drs. J. T. Welsh, H. R. L. McDougall and E. Tully.
3	Baroda Circle	2,065	2,070	Dr. Bhalchandra Krishna.
4	Eastern Gujarát Registration District.	1,759	1,948	Dr. M. B. Colah.
5	Sind Registration District ...	2,161	1,917	Drs. C. W. MacRury and J. C. H. Peacocke.
6	Northern Deccan Registration District.	1,482	1,744	Drs. W. C. Kiernander, P. S. Turnbull, O. H. Channer and J. Parker.
7	Southern Deccan Registration District.	1,494	1,673	Dr. O. H. Channer.
8	Konkan Registration District...	1,584	1,631	Drs. J. W. Clarkson and K. R. Kirtikar.
9	Cutch Circle	1,119	1,233	Dr. Dorabji Hormusji.
10	Aden	1,247	603	Drs. H. Adey, John Robb, E. Colson and A. S. Faulkner.
	Average for the whole Presidency.	1,751	1,880	

The averages are above those of last year in all the districts and circles, except in Sind and Aden. The Northern and Southern Deccan, Konkan, Cutch and Aden are below the average for the whole Presidency. The Northern Deccan, the Eastern Gujarát, Baroda and Cutch circles have risen from their respective places (8th, 5th, 4th and 10th) to the 6th, 4th, 3rd and 9th; whilst Konkan, Sind and Aden have fallen from the 6th, 3rd and 9th to the 8th, 5th and 10th places. The three others—Southern Deccan, Presidency Circle and Western Gujarát—hold the same places as last year.

English Lymph.

35. The first statement on the opposite page shows the result of the English lymph received during the year. There were 6 separate consignments, 2 of 45 tubes each, for the Bombay District and 4 for Aden, where English lymph is now sent direct. The first Bombay consignment did not prove so successful as the second. The first proved ineffectual in the Eastern and Western Gujarát, Sind and Baroda, and the second in the Konkan and Baroda. In Aden the reserved stock did not take at all; while the first, second and the third produced only 10 good vesicles out of 54 insertions on the arms of 18 children.

Quality of the Lymph in use.

36. The quality of the lymph in use was throughout good, except in the Western Gujarát, where it requires renovation, as it has been pronounced to have lost its full force on account of its not being renewed for a long time.

Lymph supplied.

37. During the year lymph was supplied to the Medical Officers, 3rd Cavalry, Mominabad; 3rd Infantry, Jaulna; 2nd Regiment, Light Cavalry, Poona; Senior Medical Officer, Aurangabad; Medical Officers, Khandála, Belgaum and Asirgarh Staff Hospitals; Railway Surgeon, Igatpuri, and to the Agency Surgeon, Zanzibar, from the Northern Deccan; to the Medical Officers, Belgaum and Sátára Station Hospitals, from the Southern Deccan; to the Superintendent General of Vaccination, Rájputana, from the Konkan; to the Medical Officers, 23rd Regiment N. I. I., Ahmedabad, and 17th Regiment, Neemuch, from the Eastern Gujarát; to the Medical Officers in charge of the troops at Deesa and Rájkot from the Western Gujarát; to the several Medical Officers in Beluchistán, Afghánistán and Persian Gulf and to the Deputy Sanitary Commissioner, Eastern Circle, Panjáb, from Sind; and to the Medical Officer, 25th Native Infantry at Bhuj, from Cutch.

Supplies received in.	No. on the Packet.	Districts and Circles.	Number of Tubes Tested and Issued.	Number of Children operated on.	Insertions.	Resulting Vesicles.	Character of Vesicles.	Remarks.
November 1882.	84 209 226	Northern Deccan Registration District.	7	6	21	13	Large	Lymph dried up in one tube. Nineteen children were vaccinated with the lymph from these vesicles.
	228 229	Southern Deccan Registration District.	6	5	27	8	Good.	
	230 265	Konkan Registration District ..	6	6	24	15	Mostly poor, but in 2 cases very fair.	Good vesicles in 3 out of 5 children vaccinated from the resulting vesicles.
	227	Eastern Gujarát Registration District.	6	6	32	..	Total failure.	
	263 280	Western Gujarát Circle	6	6	26	1	Very small.	
	266	Sind Registration District ..	7	6	48	1	Middling	Lymph proved successful from the resulting vesicle.
	200 481	Baroda .. .. Cutch	4 3	4 3	24 13	.. 6	Failed. ,, ,,	
		Total ..	45	42	224	44		
December 1882.	74	Northern Deccan Registration District.	7	5	15	10	Large	One tube broken in transit. Thirteen children were vaccinated with the lymph from these vesicles.
	83 87	Southern Deccan Registration District.	6	11	66	30	Good.	
	91	Konkan Registration District ..	6	6	30	4	Bad.	
	94	Eastern Gujarát Registration District.	6	7	30	12	Middling good on the first 4 and good on the other 3 children.	Fourteen children were vaccinated with the lymph from these vesicles. Lymph distributed.
	402	Western Gujarát Circle	6	5	30	10	Small, but fairly good.	
	77	Sind Registration District ..	7	6	48	21	Good.	
	403	Baroda	4	4	24	3	Well formed.	
	94	Cutch	3	3	13	7	Good.	
		Total ..	45	47	262	97		
	Reserved June .. Sept. ..	Aden	6 6 6	6 6 6	18 19 18	.. 3 1	Failed. Very good .. .. Do.	Failed in 5 children. Do. in 4 do.
	Decem. March 1883.		6 6	6 ..	18 ..	3 ..	Do.	Do. in 5 do. Kept in reserve.
		Total ..	30	24	72	10		
		Grand Total ..	120	113	558	151		

38. Animal vaccination was carried on in Bombay, Poona, Poona Cantonment, Broach, Nadiád, Anklesvar, Hánsot and Karáchi. In Karáchi it has been discontinued since July last.

Animal Vaccination.

The annexed table shows the number of heifers inoculated and the monthly result of the operations in Bombay and Poona where animal lymph was kept up throughout the year :—

Months.	Poona.			Bombay.			Total.		
	Heifers inoculated.	Successful.	Unsuccessful.	Heifers inoculated.	Successful.	Unsuccessful.	Heifers inoculated.	Successful.	Unsuccessful.
April 1882	3	3	...	41	38	3	44	41	3
May ,, ...	2	2	...	39	34	5	41	36	5
June ,, ...	5	3	2	34	29	5	39	32	7
July ,, ...	2	2	...	42	36	6	44	38	6
August ,, ...	2	2	...	31	28	3	33	30	3
September ,, ...	4	3	1	46	43	3	50	46	4
October ,, ...	1	1	...	43	39	4	44	40	4
November ,, ...	3	3	...	40	36	4	43	39	4
December ,, ...	3	3	...	46	42	4	49	45	4
January 1883	5	5	...	54	49	5	59	54	5
February ,, ...	4	3	1	81	81	...	85	84	1
March ,, ...	4	4	...	73	68	5	77	72	5
Total ...	38	34	4	570	523	47	608	557	51

In Poona 34 out of 38 heifers were successfully inoculated. Their cost was Rs. 105-3-6 against Rs. 133-3-6 last year. In Poona Cantonment animal vaccination was introduced on 21st February last, and in all 9 heifers were successfully inoculated at a cost of Rs. 54-2-0.

In Bombay 570 heifers were inoculated against 434 during the preceding year. On 47 heifers the operations proved unsuccessful. Three calves were inoculated with the Brussels' cow-lymph received from Dr. Warlomont, but the operations proved unsuccessful. The total cost was Rs. 5,449-1-6½, whilst last year it was Rs. 3,146-5-10. Animal lymph was sent to Assam, Partabgarh, British Burma, Goa, Thána, Bándra and Kúrla.

About the close of the year animal vaccination was introduced in Broach, Nadiád, Anklesvar and Hánsot. The Inspectors of Sanitation and Vaccination of Kaira and Broach zillas were sent to Bombay in October last to learn the method. The municipalities of Nadiád and Broach have sanctioned a grant of Rs. 120 each for heifer inoculation. Five heifers were inoculated in Nadiád and 14 primary vaccinations and 3 revaccinations were performed with the heifer lymph. The same number of heifers were inoculated in Broach, where 90 children were vaccinated from the animal lymph. In Anklesvar and Hánsot 18 heifers were operated on, and 135 children were vaccinated therefrom. Thus two centres of animal vaccination—Nadiád and Broach—have been this year established in Gujarát. The introduction of animal vaccination in Ahmedabad and Surat has also been proposed. In Western Gujarát, Dr. Tully intends to obtain animal lymph before next cold weather during the current year.

In Karáchi 11 heifers in all were successfully inoculated during the months of April, May and June 1882 at a cost of Rs. 39-8-0 paid by Government. It had to be discontinued, as the municipality refused to bear the extra cost.

Except in Bombay, where animal lymph only is kept up, and in Poona, Broach, Nadiád, Anklesvar and Hánsot, where both animal and human lymph were in use, vaccination in all other places was carried on from arm to arm and with human lymph. Vaccination with animal lymph was also carried on during the small-pox epidemic in Thána, Bándra and Kúrla. On the whole, the number of heifers inoculated was 645, and in 51 it failed; the total cost was Rs. 5,818-7-0½ against Rs. 3,279-9-4 last year.

Expenditure.

39. The total expenditure on account of vaccination may be seen from the following table:—

Establishment.	Total Expenditure.		Compared with the preceding year.
	1881-82.	1882-83.	+ Increase. — Decrease.
	Rs. a. p.	Rs. a. p.	Rs. a. p.
Provincial	1,13,995 1 4	1,13,936 1 7	−58 15 9
Municipal	21,939 11 3	24,595 15 4½	+ 2,656 4 1½
Cantonment	327 4 6	540 7 10	+ 213 3 4
Local Fund	73,710 6 5	77,787 6 5	+ 4,077 0 0
Native State	50,383 6 8	51,425 14 1	+ 1,042 7 5
Total ...	2,60,355 14 2	2,68,285 13 3½	+ 7,988 14 10½
			− 58 15 9
			+ 7,929 15 1½

Increase of Expenditure.

The increase under "Municipal" is owing to the increased pay to Belgaum municipal vaccinator, the Kalyán and Bhiwndi vaccinator being paid throughout the year, as also to the increase of expenditure under "animal vaccination" in Bombay. The increase under "Cantonment" is attributable to the additional grants of pay to vaccinators and peons by the Poona and Deválli Cantonment Committees. The increase under "Local Funds" is due to an increase of contingent expenditure throughout the year on account of peons' clothings, as also to the entertainment

of additional vaccinators, peons and paid candidate vaccinators. The increase under "Native States" is chiefly due to several vaccinators in Western Gujarát having been paid their gratuity for sufficient work during the year, as also to the entertainment of additional vaccinators and peons in the States of Rewa Kántha and Khairpur.

Cost of each successful case including all charges.

40. The total cost for the whole Presidency, including all charges, was Rs. 2,68,285-13-3½, and the successful cases, excluding dispensaries and the army, were 7,73,192. The average cost per each successful case was annas 5-7, or 3 pies less than last year.

Cost of each successful case after deducting the pay of the Supervising Officers by Districts and Circles.

41. The total cost and the cost per each successful case, after deducting the pay of the Deputy Sanitary Commissioners and Superintendents, is shown in the following table by districts and circles compared with that for 1881-82 :—

Names of Districts and Circles.	Deputy Sanitary Commissioners and Superintendents.	Successfully vaccinated and re-vaccinated.	Total Cost, excluding the Pay of Deputy Sanitary Commissioners and Superintendents.	Average Cost of each Successful Vaccination.	Number of Vaccinators.
			Rs. a. p.	Rs. a. p.	
Northern Deccan Registration District.	1881-82 ... Drs. W. C. Kiernander, F. S. Turnbull, 1882-83 ... O. H. Channer and J. Parker.	116,847 137,409	20,011 7 8 26,925 15 10	0 5 0 0 4 4	78 81
Southern Deccan Registration District.	1881-82 ... Dr. O. H. Channer .. .. .. 1882-83 ...	119,603 135,474	36,360 1 9 26,777 6 9	0 4 10 0 4 5	83 52
Konkan Registration District.	1881-82 ... Drs. J. W. Clarkson and K. R. Kirtikar 1882-83 ...	71,497 77,870	23,771 0 2 23,930 3 6	0 5 2 0 4 11	48 50
Presidency Circle	1881-82 ... Dr. Ananta Chandroba .. .. .. 1882-83 ...	17,646 28,781	11,497 3 3 14,611 8 74	0 10 9 0 7 7	9 9
Eastern Gujarát Registration District.	1881-82 ... Dr. M. B. Colah .. .. .. 1882-83 ...	105,452 117,758	27,639 3 1 27,992 9 3	0 4 2 0 3 10	62 63
Western Gujarát Circle ..	1881-82 ... Drs. J. T. Welsh, H. R. L. McDougall 1882-83 ... and E. Tully.	91,319 92,315	21,432 5 4 22,979 9 2	0 3 9 0 3 10	43 43
Sind Registration District ..	1881-82 ... Drs. C. W. MacRury and J. C. H. Pea- 1882-83 ... cocke.	110,404 98,553	19,254 4 6 15,606 13 2	0 4 1 0 3 0	57 56
Baroda	1881-82 ... Dr. Bhikhanáha Krishna .. .. 1882-83 ...	62,905 61,911	13,978 0 0 11,938 1 2	0 3 12 0 3 1	33 31
Cutch	1881-82 ... Dr. Dorabji Hormasji .. .. .. 1882-83 ...	34,779 30,779	7,113 5 6 7,072 0 1	0 3 1 0 3 6	17 17
Aden	1881-82 ... Drs. H. Adey, John Robb, E. Colson 1882-83 ... and A. S. Faulkner	923 419	394 0 0 410 0 0	0 6 10 0 15 8	1 1
	Total ..	712,475 773,192	2,03,749 15 9 2,12,664 7 6½	0 4 7 0 4 5	629 626

The cost per each successful case was less than last year in all the districts and circles, except the Western Gujarát, Sind, and Aden. The total cost was Rs. 2,12,664-7-6½, which, when divided amongst 773,192 successful cases, amounts to annas 4-5, or 2 pies less than for the previous year.

Work of Deputy Sanitary Commissioners and Superintendents of Vaccination.

42. The inspectorial work performed by the supervising officers may be seen from the table annexed :—

Names of Districts and Circles.	Deputy Sanitary Commissioners and Superintendents.	Number of Encampments.	Number of Travelling Days.	Distance travelled in Miles.	Number of Villages visited.	Number of Vaccinated Children inspected.
Northern Deccan Registration District.	1881-82 ... Drs. W. C. Kiernander, F. S. Turnbull, 1882-83 ... O. H. Channer and J. Parker.	62 80	155 134	2,524 1,395	774 182	13,174 2,225
Southern Deccan Registration District.	1881-82 ... Dr. O. H. Channer .. .. .. 1882-83 ...	46 68	73 139	781 1,9[illegible]	73 303	4,915 10,189
Konkan Registration District.	1881-82 ... Drs. J. W. Clarkson and K. R. Kirtikar 1882-83 ...	41 47	164 135	2,520 2,905	151 94	6,604 4,197
Eastern Gujarát Registration District.	1881-82 ... Dr. M. B. Colah .. .. .. 1882-83 ...	58 81	183 150	2,905 2,410	493 998	10,564 9,243
Western Gujarát Circle ..	1881-82 ... Drs. J. T. Welsh, H. R. L. McDougall 1882-83 ... and E. Tully.	37 49	63 78	679 782	141 190	6,041 11,672
Sind Registration District ..	1881-82 ... Drs. C. W. MacRury and J. C. H. Pea- 1882-83 ... cocke.	96 46	62 57	2,064 1,270	164 ...	9,259 ...
	Total ..	588 600	609 694	16,174 10,764[illegible]	1,360 1,118	57,480 53,9[illegible]6

In Western Gujarát the greatest number of children inspected was 12,462 against 6,061 last year, owing to Dr. Tully's having thoroughly inspected the Pálanpur States, which were not gone through since 1879; next to it is the Southern Deccan, in which the number inspected was 10,189 against 4,915 in 1881-82; the least number inspected was in the Konkan, in which the children inspected were 4,187 against 5,604 in the previous year, owing to Dr. Clarkson's being engaged on cholera duty at Panvel and on fever enquiry at Bánkot and Málvan. In Sind the less number inspected (9,320 against 12,171) is attributable to Dr. Peacocke's having gone through the very small and widely-spread villages of Thar and Párkar which were not visited for some years before. In Eastern Gujarát Dr. Colah was engaged in checking the small-pox epidemic in the towns of Ranpur and Dhandhuka and the Surat and Broach cities, and hence the number inspected (8,243) is somewhat less than in 1881-82. The less inspections in the Northern Deccan is in consequence of Dr. Parker's returning from furlough on 1st November 1882, and so he had to set out on a regular tour from 1st December—nearly a month later than usual. On the whole, the total number of children inspected is more than last year.

Districts and Circles.	Number of Vaccinated Children inspected.	Work tested by calling Names from Registers.											
		Present during Inspection.				Absent during Inspection.		Number of Persons whom the Vaccinator has returned as vaccinated.					
		Successful.											
		Good.	Middling.	Bad.	Unsuccessful.	Absence accounted for.	Absence unaccounted for.	Successful.	Unsuccessful and doubtful.	Unknown.	Total.	Excess of Operations over Registers.
Northern Deccan Registration District.	1881-82	11,879	10,906	825	639	493	6,626	...	18,853	140	122	19,115	19
	1882-83	7,602	6,956	512	398	305	6,704	...	14,503	222	168	14,893	97
Southern Deccan Registration District.	1881-82	5,169	3,405	254	209	121	5,003	...	8,753	82	147	8,982	...
	1882-83	3,733	3,161	264	113	74	1,718	1	3,265	69	135	3,437	6
Konkan Registration District.	1881-82	4,217	2,954	856	497	374	3,956	999	7,423	248	112	7,788	8
	1882-83	3,536	2,615	618	374	141	2,600	...	5,134	147	171	5,452	4
Eastern Gujarát Registration District.	1881-82	10,004	6,354	2,285	500	185	1,536	...	11,797	231	133	12,161	21
	1882-83	8,243	6,490	1,054	259	160	1,430	...	9,205	250	223	9,768	13
Western Gujarát Circle	1881-82	2,154	1,393	440	296	65	1,214	...	3,182	168	101	3,447	...
	1882-83	4,302	849	1,115	1,775	320	1,948	...	3,642	258	259	4,159	...
Sind Registration District	1881-82	2,701	1,393	376	280	121	1,535	...	3,940	171	207	4,318	5
	1882-83	1,661	665	500	220	69	697	...	1,506	139	125	1,848	...
Total	1881-82	35,924	28,124	5,036	2,730	1,371	19,910	999	56,551	1,039	822	57,812	53
	1882-83	28,816	19,736	3,131	2,642	1,068	14,718	1	41,494	1,135	976	43,605	72

43. It will be seen from the above table that for 52,926 children the results in 28,816 instances were tested by calling their names from registers, in which there were enrolled the names of 43,533 children, of whom 72 were vaccinated more than once on failure of the first operation. The results given by vaccinators were 41,494 as successful, 1,063 unsuccessful, exclusive of 72 secondary operations and 976 unknown; while on inspection they were found to be 27,808, 1,008 and 14,717. Excluding the "unknown", or rather the number of children "absent" at the time of inspection, from both sides, the vaccinators' figures give the percentages of 97·50 as successful and 2·50 as unsuccessful, while the inspection figures give them as 96·50 and 3·50. This test shows that the result noted by vaccinators is more by 1 per cent., and the discrepancy is to be observed in the Western Gujarát and Northern Deccan, where the respective percentages of successful cases ascertained are 92·20 and 96·41 instead of 95·95 and 98·70 as given by vaccinators. Again, out of 27,808 or 96·50 successful children there were 18,385 or 63·80 who had "good" cicatrices on their arms, 5,781 or 20·06 "middling", and 3,642 or 12·64 "bad," which show the degree of protection afforded. The greatest number of inspections was in the Northern Deccan and Eastern Gujarát, and the least in Sind. The number of children whose arms were inspected without the register test was 24,110, of whom 8,360 were in the Western Gujarát, 7,769 in Sind, and 6,457 in the Southern

Inspections from Vaccination Registers.

Truthfulness of Vaccination Registers.

Classification of successful cases.

Inspections without Vaccination Registers.

Deccan, whilst in the Northern Deccan and Konkan they were together 1,524. In the Eastern Gujarát no inspections were held without the register test.

Remarks on the work of the Supervising Officers.

44. With constant changes it is impossible to remark on individual efforts, but I trust it will be acknowledged that all have worked zealously and conscientiously.

Work of Inspectors and Assistant Superintendents.

45. The work of Inspectors and Assistant Superintendents of Vaccination is detailed by districts and circles in the table subjoined:—

Districts and Circles.		Number of Superintendents.	Number of travelling days.	Distance travelled in miles.	Number of Villages visited.	Work tested by called Names from Registers.													
						Number of Vaccinated Children inspected.	Present during Inspection.					Absent during Inspection.		Number of Persons whom the Vaccinator has returned as vaccinated.					
							Successful.												
							Character of Vesicles and Cicatrices.												
							Good.	Middling.	Bad.	Unsuccessful.	Absentees accounted for.	Absentees unaccounted for.	Successful.	Unsuccessful and doubtful.	Unknown.	Total.	Excess of Operations over Persons.
Northern Deccan Registration District.	1881-82.	955	1,671	10,059	1,736	46,906	40,577	3,329	1,403	1,902	13,677	2	61,362	801	638	62,801	105
	1882-83.	931	1,506	14,503	1,849	47,585	40,705	3,626	1,474	1,780	35,520	..	62,414	702	857	64,273	89
Southern Deccan Registration District.	1881-82.	1,056	1,479	22,056	2,421	62,332	47,917	10,079	2,351	1,775	16,312	139	77,702	1,003	1,042	80,347	62
	1882-83.	980	1,403	19,702	2,228	66,822	49,439	10,843	3,009	1,402	20,027	71	85,570	1,075	1,055	87,650	65
Konkan Registration District.	1881-82.	509	1,064	10,310	902	26,792	14,833	2,745	2,000	1,168	4,134	2	24,879	372	271	24,958	24
	1882-83.	339	991	7,953	739	17,726	12,272	2,702	1,944	817	2,447	2	20,259	454	421	21,204	26
Eastern Gujarát Registration District.	1881-82.	400	1,256	12,231	2,670	47,358	24,895	17,115	4,354	993	8,896	..	53,979	1,377	894	56,146	224
	1882-83.	415	1,118	10,797	2,152	45,580	20,559	14,511	3,952	923	8,588	1	51,946	1,152	1,079	54,327	193
Western Gujarát Circle.	1881-82.	262	477	4,596	936	20,626	13,923	4,651	2,228	823	4,030	..	23,502	909	859	25,269	55
	1882-83.	228	467	5,202	867	23,779	15,656	6,061	2,021	841	6,207	..	29,682	1,416	1,121	32,221	47
Sind Registration District.	1881-82.	748	1,388	16,615	3,234	46,640	14,542	19,739	13,907	4,362	20,851	23	60,974	3,245	3,401	67,664	570
	1882-83.	816	1,418	17,524	3,707	51,343	13,267	17,559	15,345	5,307	25,403	45	67,986	4,455	4,715	77,257	278
Cutch... ...	1881-82.	146	221	1,547	403	12,969	10,624	704	902	339	1,794	12	14,001	313	12	14,326	111
	1882-83.	169	216	1,613	447	13,148	11,574	358	789	426	1,729	54	14,779	183	63	15,025	110
Baroda ...	1881-82.	915	964	6,150	1,205	32,761	27,049	3,715	1,379	678	4,054	17	35,946	771	320	36,937	98
	1882-83.	844	899	6,229	1,212	33,931	27,130	4,078	1,256	379	4,730	156	36,414	799	701	37,914	90
Total ...	1881-82.	5,002	8,519	79,787	13,111	291,163	195,060	66,371	28,524	11,859	78,256	176	357,596	8,799	6,961	373,456	914
	1882-83.	4,721	8,119	78,583	13,799	300,927	195,902	59,573	33,301	11,811	96,959	310	367,585	10,241	11,139	388,965	899

There were 31 Inspectors and 4 Assistant Superintendents on travelling duty. Of this number 27 Inspectors and 2 Assistant Superintendents were paid by Government, and the others by Native States. The names of 388,066 children were called from the registers, and 300,827 were present, 86,923 were absent, but known to be absent, and 316 could not be accounted for, as they had migrated. Out of 300,827 children inspected, 288,916, or 96·04 per cent., were protected, and in 11,911 cases, or 3·96 per cent., the operation was unsuccessful. Again out of 288,916, or 96·04 per cent. successful cases, 195,982 or 65·15 per 100 had "good" cicatrices, 59,573 or 19·80 "middling", and 33,361 or 11·09 "bad". In the registers tested, the results were entered as 367,585 successful, 10,241 unsuccessful, 11,139 unknown or absent, and 899 secondary operations. Excluding the unknown and secondary operations from calculation, to compare this result with that of inspection, the percentages of successful and unsuccessful cases are respectively 97·52 and 2·48. The rate of travelling was quicker than last year in the Northern Deccan and Southern Deccan and Western Gujarát, and the number of villages seen was greater in the Northern Deccan, Sind and Cutch only. The greatest number of villages seen was in Sind. The number of children inspected

was greater in all the districts and circles except the Konkan and Eastern Gujarát. Four Inspectors were promoted—1 in the Northern Deccan and 1 in the Southern Deccan—from 3rd to 2nd class, and 1 in the Eastern Gujarát and 1 in Sind from 2nd to 1st class. Two Inspectors were degraded for misbehaviour—1 in the Southern Deccan from 2nd to 3rd class and 1 in Baroda to Head-vaccinatorship. Seven were transferred—2 in the Northern Deccan and 5 in Sind. There was 1 resignation in the Northern Deccan. The conduct of all these inspecting officers, with one or two exceptions, was reported as good and satisfactory.

Their conduct.

46. Taking the work of all the Deputy Sanitary Commissioners, Superintendents, Assistant Superintendents and Inspectors together, there were 4,811 encampments, 87,620½ miles travelled in 8,797 days, and 353,753 children inspected in 14,852 villages. Out of every 100 persons operated on, 41·20 were this year inspected against 43·72 in the preceding year, 46·27 in 1880-81, 43·10 in 1879-80, 45·58 in 1878-79, and 35·53 in 1877-78.

Total Inspections.

47. Six vaccinators were dismissed the service—3 in the Northern Deccan for misconduct and incompetency, 1 in the Southern Deccan for misconduct, 1 in Western Gujarát for gross negligence, and 1 in Baroda for influencing the Inspector to take no notice of the conduct of a vaccinator. Two vaccinators, 1 in the Northern Deccan, was suspended for misconduct, and 1 in Western Gujarát for embezzlement of money. Five vaccinators were degraded for laziness and misbehaviour—1 in the Northern and 2 in the Southern Deccan, 1 in Western Gujarát and 1 in Baroda. Six vaccinators died, 1 in each of the 5 registration districts and 1 in Western Gujarát. Seven vaccinators resigned the service—2 in the Northern Deccan, 2 in Eastern Gujarát, 2 in Western Gujarát and 1 in Sind. Five vaccinators retired on pension—2 in the Northern Deccan, 2 in Eastern Gujarát, and 1 in Konkan. Twenty-five vaccinators were transferred—4 in the Northern Deccan, 6 in Eastern Gujarát and 15 in Sind. Twenty-one vaccinators were promoted—11 in the Northern Deccan, of whom 1 was appointed a second clerk, and 1 a third class Inspector, 2 in Konkan, 2 in Eastern and 3 in Western Gujarát, 2 in Sind, and 1 in Baroda, as an Inspector. There were 21 new appointments—2 candidates and 3 vaccinators in the Northern Deccan, 3 candidate vaccinators in the Southern Deccan, 1 candidate and 2 vaccinators in the Konkan, 4 candidates and 1 vaccinator in Eastern Gujarát, and 4 candidates and 1 vaccinator in Sind. The conduct of the vaccinators generally was good.

Conduct of Vaccinators.

48. Three clerks in the Northern Deccan were dismissed for misbehaviour. Three clerks, one in each of the Northern and Southern Deccan and the Eastern Gujarát Registration District, resigned. Nine clerks were promoted, 1 in the Northern Deccan as a third class Inspector; 2 in the Southern Deccan—1 to a higher grade and 1 as an Assistant Superintendent of Vaccination, Kolhápur States; 2 in Eastern Gujarát to higher grades, and 4 in Sind—1 as a Superintendent of Vaccination, Karáchi, and 3 to higher grades. All the clerks have worked to the entire satisfaction of their superiors.

Clerks.

49. Inoculation was not practised anywhere in the districts. In Konkan 2 native vaids, Kanu and Gundya bin Rama Mhadik, are said to have inoculated several children (75) with matter from small-pox vesicles in the village of Nandivde, Tarf Santivádá, in Ratnágiri Táluka. The case was at once forwarded by Dr. Clarkson to the Collector for enquiry, but no reply was received by him up to 2nd June 1883.

Inoculation.

50. No instances were reported of any other disease but cow-pox having been communicated through vaccination.

Ill-effects by Vaccination.

51. The Civil, Revenue and Political Officers have rendered their aid, when required, to all the officers of this department.

Aid from Civil, Revenue and Political Officers.

52. The table on the opposite page shows the deaths from small-pox for

No.	Divisions and Circles.		Years.	Deaths from Small-pox.			Number of Persons successfully operated on.
				Total Deaths.	Ages.		
					Under 1 year.	Under 13 years.	
1	Northern Deccan Registration District.	Khándesh Collectorate ...	1881-82	11	...	8	38,037
			1882-83	1,592	488	1,085	43,708
2		Násik do.	1881-82	4	1	3	21,999
			1882-83	166	60	77	22,447
3		Ahmednagar do.	1881-82	...	...	...	21,955
			1882-83	194	79	115	27,720
4		Poona do.	1881-82	10	2	8	18,776
			1882-83	1,198	389	525	24,859
5		Sholápur do.	1881-82	...	...	...	15,960
			1882-83	3	...	3	22,016
		Total ...	1881-82	25	3	19	115,807
			1882-83	3,153	1,016	1,775	140,760
6	Southern Deccan Registration District.	Sátára Collectorate	1881-82	1	...	...	30,725
			1882-83	56	15	31	33,211
7		Belgaum do.	1881-82	23	1	...	21,237
			1882-83	65	18	18	24,556
8		Dhárwár do.	1881-82	...	...	...	19,947
			1882-83	62	21	26	23,034
9		Kaládgi do.	1881-82	...	...	...	13,562
			1882-83	8	...	8	18,993
		Total ...	1881-82	24	1	...	85,471
			1882-83	191	54	83	96,794
10	Konkan Registration District.	Kánara Collectorate	1881-82	3	...	...	10,533
			1882-83	61	5	8	11,319
11		Ratnágiri do.	1881-82	8	2	2	22,891
			1882-83	119	30	32	23,455
12		Kolába do.	1881-82	72	32	21	10,025
			1882-83	135	28	42	9,895
13		Thána do.	1881-82	22	5	12	25,823
			1882-83	951	292	549	25,898
		Total ...	1881-82	105	39	35	67,212
			1882-83	1,266	355	631	70,567
14	Presidency Circle.	Bombay City	1881-82	31	11	12	17,951
			1882-83	1,128	385	462	32,851
15	Eastern Gujarát Registration District.	Surat Collectorate	1881-82	7	3	3	15,545
			1882-83	943	282	609	20,146
16		Broach do.	1881-82	2	2	...	8,199
			1882-83	75	28	47	10,482
17		Kaira do.	1881-82	1	...	1	20,388
			1882-83	5	4	1	21,423
18		Panch Mahals	1881-82	1	1	...	8,062
			1882-83	6	1	5	8,179
19		Ahmedabad	1881-82	2	2	...	25,043
			1882-83	52	11	41	27,461
		Total ...	1881-82	13	8	4	77,237
			1882-83	1,081	326	703	87,691
20	Sind Registration District.	Karáchi Collectorate	1881-82	98	14	44	19,975
			1882-83	153	12	22	20,307
21		Hyderabad do.	1881-82	35	10	21	28,198
			1882-83	284	83	77	24,145
22		Thár and Párkar	1881-82	2	...	...	15,549
			1882-83	8	1	4	14,229
23		Shikárpur Collectorate ...	1881-82	158	41	64	40,690
			1882-83	18	5	5	33,990
24		Upper Sind Frontier	1881-82	22	8	3	5,817
			1882-83	...	...	...	4,707
		Total ...	1881-82	315	73	132	109,929
			1882-83	463	101	108	97,369
		Grand Total ...	1881-82	513	135	202	473,007
			1882-83	7,282	2,237	3,762	526,032

Small-pox by Collectorates and Registration Districts.

the years 1882-83 and 1881-82, as well as the ages of the deceased and the number of persons successfully operated on in each district of the Bombay Presidency.

It will be observed that small-pox was raging this year every where throughout the Presidency, but to the greatest extent in the Northern Daccan, Konkan, Bombay City and Eastern Gujarát.

(*a*). In the Northern Deccan Dr. Parker says: "I am very confident that, large as the number of deaths is, it would have been very much greater were it not for the very excellent work done by some vaccinators, who, when circumstances compelled their transfer to sites most requiring their presence, worked with commendable zeal."

(*b*). In Konkan Dr. Clarkson gives the following account of the spread of the disease in each district under his charge :—

"Small-pox has appeared in all the collectorates of this division during the year. In Kánara it was in the collectorate in April and continued throughout the year, being mostly in the táluka of Siddápur. In Kárwár an outbreak began in February owing to a man with the disease being landed at Kárwár by the British India steamer from Bombay. The case was immediately isolated, but the disease spread to a certain extent in spite of all measures. No deaths occurred, however.

"In Ratnágiri the disease began in May 1882, and deaths occurred in May, June and December; but the number was very small. In the beginning of the present year the numbers gradually increased, and in March there were 77 deaths. The origin of the outbreak cannot be ascertained; but Mr. Kinloch, of Dápoli, states that the disease was introduced into the village by a man who came down from Bombay with the fever on him in January 15th, 1883. The Inspector of the zilla also reports that the disease was introduced into Ratnágiri by passengers from Bombay.

"The Kolába Collectorate has suffered from the disease throughout the year, there being deaths in every month except September. The Mángaon Táluka has suffered the most. The origin has not been traced, but the Inspector reports that in certin villages in Mángaon Táluka the disease was imported by men who came from Bombay. Thána Collectorate has suffered very severely during this year. The first report I received was that it had broken out in Kalyán; the Assistant Surgeon there could not trace its origin. The outbreak continued to increase in severity till the end of the year. There is no report showing how the disease originated or spread. The Inspector has made reports showing how the outbreaks occurred in different villages that he could get to, but a general view for the zilla cannot be given."

(*c*). In the Presidency Circle small-pox has again appeared at the close of the year after a lapse of seven years, and attained greater virulence and malignancy than in 1875-76. It caused 1,128 deaths, of which 385 were among infants, whilst in that year there were 3,174 deaths, and of these 1,301 were infants. Dr. Ananta says: "That not an inconsiderable number of cases that proved fatal were none of ours, is certain; for they are reported to have died within a few days of their arrival here. Some, indeed, came with the disease on their bodies."

(*d*). As regards the prevalence of small-pox in Eastern Gujarát, Dr. Colah says as follows :—

"During the last quarter of the year, small-pox made its appearance in an epidemic form principally in 3 parts of this district, viz., in Surat city, in Broach city and Hánsot town, in Ranpur and Dhandhuka towns, and some villages of the táluka and in 4 villages situated in the most southern part of Viramgám Táluka.

"In Surat city deaths from small-pox commenced to occur from the beginning of the year, but they were very few up to the end of November (the greatest number—14—being returned in June), but towards the close of December the disease put on an epidemic form, and in the last quarter of the year a heavy mortality occurred from it, chiefly in children of from 2 to 6 years of age who had escaped vaccination. From the middle of March a severe and fatal epidemic of measles has set in, and many deaths from it have come to be included in March and April. In addition to the municipal vaccinator 3 additional vaccinators were employed in Surat city to push on vaccination, and other steps were taken to check the disease: the number of vaccinations performed in the city during the height of the epidemic was 3,604. Considering the amount and severity of the source of infection in Surat city and the vastly increased communication between it and other parts of Gujarát consequent upon the large number of marriages which came off in the city in February and March, the extent of prevalence of the disease in Surat District and other parts of Gujarát appeals to have been very little. The tálukas situated near the city being most affected, and the others to

a very little extent, even in the neighbouring tálukas, the deaths were few, showing the amount of protection in them to be effective.

"In the Broach Collectorate small-pox occurred in the city of Broach and in Hánsot, Ankleswar and Amod towns: in the latter two, however, no deaths occurred. The rural circles remained entirely free, not a single report of its occurrence having been received from any of the táluka villages. In Broach city and in Hánsot town the disease appears to have been imported from Surat, about the close of December in the former and about the close of February in the latter. In all places every endeavour was made to push on vaccination and check the disease; and the Inspector of the zilla, Mr. Mula Amirudin, was indefatigable in his exertions, and the small prevalence in Broach city is mainly owing to his early exertions. He was also most useful in meeting the demands of the European merchants and officials for revaccination. His work during the last 3 months has been really praiseworthy.

"In the Kaira Collectorate 5 deaths occurred in June 1882 in one village (Haugari) of Thásra Táluka; with this exception the district remained free of the disease.

"In the Panch Maháls 2 deaths occurred in Dohad town in June and 1 in July 1882, and 3 deaths in one village of Jhálod Táluka in December and January, and a few cases were reported from one village of Godhra Táluka. About the close of the year the appearance of the disease in the town of Dohad was again reported: all the other parts of this district are reported free.

"In the Ahmedabad Collectorate 2 deaths occurred in the village of Juska of Dhandhuka rural circle in April 1882. The whole district was free up to the close of October, when 1 death was reported as having occurred in Ranpur town. From Ranpur the disease was imported into Dhandhuka town and in some villages of the táluka. I was in the month of December travelling in this táluka, and made arrangements for the thorough vaccination of the towns and the revaccination of all the school children. The disease broke out in a very bad form in some of the southern villages of Viramgám Táluka, and the Inspector was employed there for nearly 3 months to check the disease. From Ahmedabad city no small-pox cases were even reported. Some cases occurred among the railway employés, the disease having been imported from Bombay, and 1 European officer of the Salt Department came ill with fever from the district and took ill in the city.

"The Inspectors of Surat and Ahmedabad worked fairly well during the epidemic months—the former in Surat City and the latter in Viramgám Táluka—to check the disease."

In Western Gujarát cases of small-pox were reported to have occurred in 63 villages, 1 each in Sáyla, Pálitána, Bhávnagar, Mángrol, Mádhavpur, Morvádá, and Dantivádá; 2 each in Mahuva, Limbdi, Lakhtar, Dhrángadra, and Junágad; 3 in Wadhwán; 4 each in Jasdan, Mália and Dhrol; 7 in Vánkáner; and 8 each in Morvi, Kundla, and Botád. On the whole, there were 7,282 deaths against 513 in 1881-82, and the number of successful operations was 526,032, whilst last year it was 473,607. There were 2,237 infants, 3,762 children under 12 years, and 1,283 persons of all other ages returned under small-pox deaths; last year the respective numbers were 135,202 and 176. The only collectorate that was free from deaths was Upper Sind Frontier, whilst in Sholápur there were 3 deaths, in Kaira 5, in Panch Maháls 6, and in Kaládgi and Thar Párkar 8 each. In Shikárpur there were only 18 deaths against 158 last year. In Baroda 127 cases occurred (19 proved fatal), and 105 of these were unprotected.

Small-pox occurring after vaccination.

53. A few cases of small-pox of a modified character, occurring after vaccination, were noticed by vaccinators in Sind, but they were of a modified character. In Konkan Dr. Clarkson notices some few cases as follows:—

"Fifty-four cases of a small-pox occurring after vaccination have been reported by some Medical Officers.

"1. In Thána there were 10 cases seen, of which 6 were previously vaccinated.

"2. In Bándra 1 case was seen to be unprotected, but all cases could not be seen.

"3. In Panvel almost all cases are reported to have been unprotected.

"4. The Dápoli Medical Officer reports that out of 39 cases of small-pox at Gujmona, 36 were vaccinated previously: 5 deaths occurred.

"5. In Vengúrla 3 cases came under observation, all of whom had been previously vaccinated.

"6. In Sávantvádi 8 cases out of 9 were previously vaccinated. No deaths.

"7. The Medical Officer, Sirsi, reports that out of 16 cases 6 had been previously vaccinated, and they had the disease mildly."

In the Presidency Circle Dr. Ananta Chandroba met with cases of small-pox after vaccination, and made full enquiries on the subject. He says :—

"I had read in the medical periodicals that in England the frequency of the occurrence of small-pox after vaccination was too great to be satisfactorily so accounted for. Enquiries were instituted under the guidance of the ablest and most competent of the profession, and they had come to the conclusion that much of the failure of vaccination to give the necessary and expected protection against small-pox arose from the practice of it by incompetent, inexperienced, careless men of no practical skill, and from the use of bad or preserved lymph. Cases of small-pox in the vaccinated increased to such an extent that many were at last compelled to admit that vaccination did not give permanent protection against small-pox as originally believed, and that at least a second operation was necessary before this protection could be fully secured. Whatever the opinion of these professional gentlemen, or, indeed, of the whole profession there, my faith in vaccination continued unshaken. I had about me hundreds of persons whom I had vaccinated 25 years ago. Many of them had cases of small-pox occurring in their houses, and they could not but come in very intimate and close contact with the sufferers. The test was as perfect and crucial one as could well be devised, short of the direct insertion of small-pox virus, and they all stand it well. During the present epidemic many of the persons that died from small-pox were reported to have been previously vaccinated. Inquiries made at the time corroborated the statement. But from the same enquiries I also learnt that of the 1,128 persons that died from small-pox, not one was previously successfully vaccinated here. There were, certainly, not wanting cases where vaccination was performed and where the operation was so far successful as to produce the genuine vaccine vesicle, but where death ultimately took place from small-pox. But the fact was that in these cases the operation was had recourse to too late; and the induced vaccination, though perfect in itself, could not affect the course of the small-pox person which had anticipated the vaccine lymph and had occupied the system long before its advent. The two diseases ran their course side by side, from the first to the last, distinct from each other. Even in the most confluent case you would see the vaccine vesicle standing out in bold relief, but in the end the more powerful carried the day. In some instances, indeed, persons came with the fever on to the public vaccine stations to be vaccinated. I knew that the operation was thoroughly useless in such cases; but as it could do no harm, I humoured the applicant and performed it. This was the case very frequently with the Goanese Portuguese Native Christians who came from Goa when the disease was prevailing. It was sad to see that many of these Portuguese had ran to Bombay to escape from the epidemic that was there prevailing, but had unfortunately and unwisely stayed there too long to have remained free from the contamination.

"There is no denying the fact that during the present epidemic very many persons that were supposed to be successfully vaccinated before suffered from small-pox, and not an inconsiderable number of these had the disease in such a severe form as to prove fatal. Case after case in the reports of the Health Officer bore the remark 'Vaccinated', and our inquiries went far to confirm the correctness of the report. We had no way of getting at all the cases of small-pox, or even a portion of them, that occurred in Bombay. Some cases, such as were under treatment in the different hospitals here, were brought to our notice by the Health Department, but our men could have no access to them. I myself saw 4 cases, and was informed of 2 more where we had vaccinated them successfully before. With one exception they were mild, of the modified form, and they all recovered. With small-pox of the malignant type we had prevailing all about it would certainly have been strange if there were not cases of small-pox even in the previously vaccinated or naturally attacked. I was satisfied that our vaccinations would stand the test well, and all our inquiries went to prove the correctness of the surmise. With the assistance of the whole of my establishment, however, I could come at only 6 cases. This was not sufficient to fully satisfy me. I thought it advisable to try from every possible source to collect information on the subject, and it occurred to me that the best thing I could do was to apply to the practising professional men of this place to favour me with it. I accordingly addressed them a printed circular letter with an accompanying form, requesting them to kindly fill the form with the required information, observing that, should they for want of records be unable to give it categorically, their impressions would be equally valuable and welcome. I forwarded some 130 of these letters to the different professional gentlemen, and was in hope of being able to collect a large amount of very valuable and useful information on the subject; but as yet I received only 16 responses, of which as many as 6 were through the courtesy of the Surgeon General. With one exception, that from Honorary Surgeon-Major Mr. Anderson, the letters have conveyed very little information. Even our hospital authorities, though they had between themselves 499 cases of small-pox under treatment, and of these 143 were in successfully vaccinated persons, had not the information to give us which we wanted the most. Altogether, I must say that my attempt has proved a miserable failure, and I yet cannot see how to account for it. I conclude from this, that the professional gentlemen had little or no information to give, as they did not see cases of small-pox after vaccination; thus confirming my opinion on the subject, viz., that small-pox after vaccination was most met with in persons vaccinated in the Mofussil. I hope shortly to be able to collect information on the subject and to embody it in a table, showing how many suffered from small-pox after vaccination, and where they were primarily vaccinated. But as the information will have to

be gathered from the records of the Health Department, it will be some time before I shall be in a position to forward it to the superior authorities."

The printed letter referred to was circulated to Civil Surgeons, &c., by the Surgeon General with the Government of Bombay, and Government in the General Department have also been asked to move the Governments of Bengal, North-West Provinces, Punjab, Central Provinces and Madras to obtain from their Medical Officers the results of their personal observation in such cases.

Progress in the Northern Deccan Registration District.

54. The Northern Deccan Registration District extends over an area of 36,845·7 square miles, comprising the collectorates of Khándesh, Násik, Ahmednagar, Poona and Sholápur, and the Native States of the Khándesh Agency, Akalkot and Modnimb. It has a population of 4,384,856. It was administered by a Deputy Sanitary Commissioner, who had under him 7 Inspectors of Sanitation and Vaccination, 2 clerks, 8 municipal, 1 cantonment, 71 local fund and 1 Native State vaccinators and 91 peons. An additional vaccinator is required for 1 town circle. Vaccination returns were received from 25 dispensaries. Each vaccinator, on an average, worked amongst a population of 54,134 souls and in an area of 454·9 square miles. They primarily vaccinated 138,406 and revaccinated 2,887 persons: last year the respective numbers were 113,197 and 2,428. There were 135,575, or 97·95 per cent., successful cases under primary vaccinations, and 834, or 63·53 per cent., under revaccinations. These together give the total rate of protection as 31·34 per mille of population, whilst last year it was 26·12. The total cost was Rs. 43,773-9-0, and the average cost per each successful case was annas 5 and pies 2, or 1 anna less than in the preceding year. Each vaccinator averaged 1,744 persons. The Medical Officers of 25 dispensaries returned 6,508 persons primarily vaccinated and 190 revaccinated against 5,387 and 159 in 1881-82. There were 3,153 deaths from small-pox, whilst last year there were only 25.

Khándesh Collectorate.

55. The Khándesh Collectorate had 25 vaccinators, each of whom had, on an average, an area of 397·7 square miles and a population of 49,489 souls. They primarily vaccinated 42,482 persons, and in 41,388 instances, or 97·42 per cent., were successful; they revaccinated 119 persons, and in 91 cases, or 76·47 per cent., were successful. The rate of protection per mille of population was 33·53 against 30·75 in 1881-82. The total cost of vaccination was Rs. 7,199-14-1, or annas 2 and pies 9, or 4 pies less than last year, per each successful case. The average number of operations per each vaccinator was 1,704. The Medical Officers of 6 dispensaries attended to vaccination work, which amounted to 2,322 and 12 persons under each kind of operation. There were 1,592 deaths from small-pox, whilst last year there were 11.

Násik Collectorate.

56. The Násik Collectorate had 13 vaccinators, but another is required for the town of Yeola. The average population and area per vaccinator were respectively 60,093 souls and 457 square miles. There were 20,892 primary vaccinations and 135 revaccinations; and 20,543 and 101, or 98·33 and 74·81 per cent., were successful. The rate per mille of population protected was 26·43, whilst last year it was 24·96. The total cost was Rs. 3,945-4-3, or annas 3, or 1 pie less than last year per each successful case. Each vaccinator vaccinated 1,618 persons. In 7 dispensaries 1,895 persons were primarily vaccinated and 10 were revaccinated. There were 166 deaths against 4 in the preceding year.

Ahmednagar Collectorate.

57. The Ahmednagar Collectorate had 13 vaccinators, and the average population and area per vaccinator were respectively 57,787 souls and 512·8 square miles. There were 27,499 primary vaccinations and 326 revaccinations, and the successful cases were respectively 27,290 and 215, whilst the percentages of success were 99·24 and 65·95. The rate per 1,000 of protected was 36·61 against 28·99 last year. Each vaccinator vaccinated 2,140 persons. The total cost was Rs. 3,948-6-3, and the average cost for each successful case was annas 2-3, or 7 pies less than last year. The Medical Officers of 2 dispensaries primarily vaccinated 240

persons and revaccinated none. There were 194 deaths: last year there were none.

Poona Collectorate.

58. The collectorate of Poona had 17 vaccinators. The average population and area per vaccinator were respectively 52,978 souls and 314·6 square miles. Out of 23,627 primary vaccinations and 1,315 revaccinations, 22,912 or 96·97 and 586 or 44·56 per cent. were successful. The rate per mille of population protected was 26·09 against 19·95 last year. Each vaccinator has, on an average, operated on 1,467 persons. The total cost was Rs. 4,473-3-3. This gives the average cost per each successful case as annas 3-0 against annas 3-8 last year. In 8 dispensaries 1,528 persons were primarily vaccinated and 8 were revaccinated. There were 1,198 deaths from small-pox: last year there were 10.

Sholápur Collectorate.

59. The Sholápur Collectorate had 12 vaccinators, each of whom had, on an average, an area of 376·8 square miles and a population of 48,541 souls. There were 21,868 primary vaccinations and 438 revaccinations; of these 21,475 and 335, or 98·20 and 76·48, were successful. The rate per mille of population protected was 37·44 against 27·12 in 1881-82. Each vaccinator vaccinated 1,859 persons. The total cost was Rs. 4,009-4-11, which gives annas 2-11 as the average cost per each successful case: last year it was annas 3-4. At the Karmála Dispensary 215 persons were primarily vaccinated. There were 3 deaths from small-pox: last year there were none.

Native States in the Northern Deccan Registration District.

60. The Native States are the Dáng Territory, Akalkot and Modnimb, which belongs to the Miraj State. They have a collective population of 132,083 and an area of 4,427 square miles. A vaccinator was sent to the Dáng Territory on 1st May 1879; but the opposition being too strong, he was withdrawn and transferred to British territory. In Modnimb vaccination is carried on by the Mádha Táluka vaccinator of the Sholápur Zilla, as it is close to that táluka. He is paid Rs. 5 per month by the Miraj State. The Akalkot State has 1 vaccinator, and the Medical Officer of the Akalkot Dispensary attends to the vaccination work of that town. The total number operated on in the 2 States, excluding the dispensary, was 2,592, of which 554 were revaccinations. The successful cases were 1,967, or 96·52 per cent., and 506, or 91·34 per cent., under each kind of operation. The rate of protection per 1,000 was 18·72 against 15·20 last year. The total cost was Rs. 332, or annas 2-2 per each successful case, against annas 3-2 last year. In the Akalkot Dispensary 308 persons were primarily vaccinated and 160 revaccinated.

Progress in the Southern Deccan Registration District.

61. The Southern Deccan Registration District comprises the collectorates of Sátára, Belgaum, Dhárwár and Kaládgi, the Kolhápur States, the Sátára and the Southern Marátha Jághírs and the Savanúr State under the Dhárwár Agency. It has a population of 5,091,383 and an area of 28,781·4 square miles. It was administered by a Deputy Sanitary Commissioner, who had under him 6 Inspectors of Sanitation and Vaccination, 1 Assistant Superintendent of Vaccination, 2 clerks, 6 municipal, 47 local fund and 30 Native State vaccinators and 94 peons. Vaccination was carried on by the Medical Officers of 30 dispensaries. Eleven additional vaccinators for 4 towns, 3 rural circles and 4 Native States are required to strengthen the establishment. Each vaccinator has an area of 346·8 square miles, with an average population of 61,342 souls. They primarily vaccinated 135,786 and revaccinated 3,052 persons, and last year the respective numbers were 121,629 and 2,376. There were 131,168, or 96·60 per cent., successful primary vaccinations, and 2,305, or 75·52 per cent., revaccinations; the rate of protection per mille of population being 26·22 against 23·49 last year. The total cost was Rs. 43,977-6-9, and the average cost per each successful case was annas 5 and pies 3—6 pies less than last year. Each vaccinator vaccinated 1,673 persons. In the dispensaries 6,713 persons were primarily vaccinated, and 404 were revaccinated. There were 191 deaths against 24 last year.

Sátára Collectorate.

62. The Sátára Collectorate has 14 vaccinators, and 2 others are required for the towns of Karád and Wái. One more has been added during the current year between the Málcolm

Peth and the Khandála Petha of the Jávli Táluka. Each vaccinator had, on an average, a population of 75,882 souls and an area of 356·3 square miles. There were 32,048 persons primarily vaccinated and 374 revaccinated. The successful cases in each were 31,249 or 97·51, and 332 or 88·77 per cent. The rate of protection per mille of population was 29·73 against 27·18 in 1881-82. Each vaccinator vaccinated 2,316 persons. The total cost was Rs. 4,085-11-6, or annas 2-1 per each successful case, against annas 2-3 in the preceding year. In 7 dispensaries 1,735 persons were primarily vaccinated and 11 were revaccinated. There were 56 deaths against 1 last year.

Belgaum Collectorate.

63. The Belgaum Collectorate has 12 vaccinators, and 2 more are required for the towns of Gokák and Athni. Each vaccinator had, on an average, a population of 72,001 souls and an area of 388·1 square miles. The number of persons under each kind of operation was 23,221 and 792. The successful cases were 22,795 and 626, the percentages of success being 98·16 and 79·04, or 27·11 per mille of population against 23·45 for last year. Each vaccinator vaccinated 2,001 persons. The total cost was Rs. 3,546, or annas 2-5 per each successful case; last year it amounted to annas 2-9. In 4 dispensaries 1,174 persons were primarily vaccinated and only 3 revaccinated. There were 65 deaths against 23 last year.

Dhárwár Collectorate.

64. The Dhárwár Collectorate has, in all, 18 vaccinators, each of whom had, on an average, a population of 49,050 souls and an area of 251·9 square miles. There were 23,192 persons primarily vaccinated and 1,018 revaccinated. The successful cases in each were 22,293 and 671, or 96·12 and 65·91 per cent. Out of every 1,000 persons 26·01 were successfully vaccinated against 22·53 in 1881-82. The average number of vaccinations performed by each vaccinator was 1,345. The total cost was Rs. 5,196-12-0, or annas 3-8 per each successful case: last year it was annas 4-1. In Háveri Dispensary 103 persons were primarily vaccinated and 8 persons were revaccinated. There were 62 deaths: last year there were none.

Kaládgi Collectorate.

65. The Kaládgi Collectorate had 9 vaccinators. The Bágalkot town vaccinator attends to the vaccination work in the surrounding villages of the táluka besides the town, and, consequently, a moiety of his pay is defrayed by the municipality as well as by the local fund committee. At least 3 additional vaccinators are required for the tálukas of Hungund, Bádámi and Indi. Each vaccinator had, on an average, a population of 70,944 souls and an area of 639·7 square miles. The number of persons primarily vaccinated was 15,466, and those revaccinated were 387. The successful cases in each were 15,090 or 97·57, and 294 or 75·97 per cent. The rate of protection per mille of population was 24·09 against 20·28 in the preceding year. The average number of vaccinations performed by each vaccinator was 1,761 persons. The total cost was Rs. 2,831-9-5, or annas 2-11 per each successful case against annas 3-2 in 1881-82. Vaccination was carried on in 4 dispensaries—at Bágevádi, Ilkal, Bijápur and Muddebihál and in the Kaládgi Jail, and the number of persons primarily vaccinated was 632, and those revaccinated were only 11. There were 8 deaths against none last year.

Native States in the Southern Deccan Registration District.

66. The States of Kolhápur, the Sátára and the Southern Marátha Jághírs and the Savanúr State, under the Dhárwár Agency, have a collective area of 8,845 square miles and a population of 1,643,619. There were 30 vaccinators, but 4 more are required for Gad Hinglaj, Panhála and Kolhápur Petha in the Kolhápur States, and for Sángli Táluka in the Sángli States. The Kolhápur States have 1 Assistant Superintendent of Vaccination, and the Jámkhandi State has an Inspector of Sanitation and Vaccination. There were 41,859 persons primarily vaccinated and 481 revaccinated. The successful cases of each kind were 39,741 and 382. The percentages of success were respectively 94·94 and 79·42. The rate per mille of population protected was 24·40 against 22·89 for last year. Each vaccinator, on an average, vaccinated 1,411 persons. The total cost was Rs. 8,488-9-10, or annas 3-5 per each successful case against annas 3-9 last year. In 13 dispensaries—3 in the Kolhápur States, 6 in the Sángli States and 4 at Rámdurg, Mudhol, Miraj and Budgaon—3,056 persons were primarily vaccinated and 369 were revaccinated. Dr. Channer says

that these "dispensary officers forwarded returns of vaccination regularly, and the Politicals have afforded the usual assistance in obtaining punctual and accurate submission of returns".

Progress in the Konkan Registration District.

67. The Konkan Registration District comprises the collectorates of Kánara, Ratnágiri, Kolába and Thána, the Native States of Sávantvádi, Janjira and Jawhár, a population of 3,008,477 and an area of 15,337 square miles. It was administered by a Deputy Sanitary Commissioner, who had under him 4 Inspectors of Sanitation and Vaccination, 2 clerks, 3 municipal, 44 local fund and 3 Native State vaccinators and 60 peons. Five additional vaccinators are required—3 in town, 1 in rural circles and 1 in a Native State. Vaccinations were performed in 27 dispensaries. The area for each vaccinator was 307 square miles, with a population of 60,170 souls. The vaccinators returned 76,951 primary vaccinations and 4,604 revaccinations against 71,698 and 4,321 last year. Under each head the successful cases were respectively 75,049 or 97·53 per cent., and 2,821 or 61·27 per cent. There were 25·88 persons per 1,000 of population successfully operated on, whilst last year there were 24·43. The average number of vaccinations performed by each vaccinator was 1,631, and the average cost per each successful case, calculated on the total cost of Rs. 31,407-3-2, was annas 6·5: last year it was annas 6·7. In the dispensaries 3,609 persons were vaccinated and 894 were revaccinated. There were 1,266 deaths against 106 in 1881-82.

Kánara Collectorate.

68. The Kánara Collectorate has 12 vaccinators. One more is required for the town of Kárwár. Each had, on an average, a population of 35,153 souls and an area of 325·9 square miles. Those primarily vaccinated were 11,246 and those revaccinated were 556. The numbers of successful cases were respectively 10,220 and 325, the percentages being 90·88 and 58·45. The rate of protection per mille of population was 25·00: last year it was 22·64. Each vaccinator vaccinated 983 persons. The total cost was Rs. 3,602-4-3, or annas 5-6 per each successful case against annas 5-7 in the previous year. In 9 dispensaries 788 persons were primarily vaccinated, and 76 were revaccinated. There were 61 deaths, whilst last year there were 3.

Ratnágiri Collectorate.

69. The Ratnágiri Collectorate has 13 vaccinators, and 2 more are required for the towns of Ratnágiri and Vengúrla. Each vaccinator had, on an average, a population of 76,699 souls and an area of 301·7 square miles. The number of primary vaccinations was 22,661 and of revaccinations 931. The successful cases were respectively 22,484 and 792, or 99·22 and 85·06 per cent. The rate of protection per mille of population was 23·34, and last year it was 22·48. The average number of vaccinations for each vaccinator was 1,815. The total cost was Rs. 3,879-7-9, or annas 2-8 per each successful case against annas 2-10 last year. At the Dápoli and Vengúrla dispensaries 226 persons were primarily vaccinated and 22 were revaccinated. There were 119 deaths against 8 in 1881-82.

Kolába Collectorate.

70. The Kolába Collectorate has 6 vaccinators, and 1 more is wanted for the táluka of Mahád. Each vaccinator had, on an average, a population of 63,608 souls and an area of 249·4 square miles. There were 9,369 primary vaccinations and 716 revaccinations. The successful cases were 9,178 or 97·96, and 422 or 58·93 per cent. The rate of protection per 1,000 was 25·15 against 25·31 last year. The total cost was Rs. 1,834-15-8. The average cost per successful case was annas 3 against annas 2-7 last year. Each vaccinator vaccinated 1,681 persons. In 3 dispensaries 316 persons were primarily vaccinated, and only 1 was revaccinated. There were 135 deaths against 72 in 1881-82.

Thána Collectorate.

71. The Thána Collectorate has 16 vaccinators. Each vaccinator had, on an average, a population of 56,784 souls and an area of 265·2 square miles. Those primarily vaccinated were 23,998, and those revaccinated were 1,281. The successful cases were 23,530 and 541, or 98·05 and 42·23 per cent. The rate of protection per mille of population was 26·49: last year it was 24·84. Each vaccinator vaccinated 1,580 persons. The total cost was Rs. 4,688-15-9, or annas 3-1 per each success-

ful case against annas 3-4 last year. In 12 dispensaries 1,934 persons were primarily vaccinated and 536 revaccinated. There were 951 deaths: in the preceding year there were 22.

Native States in the Konkan Registration District.

72. The States of Sávantvádi, Janjira and Jawhár have a collective area of 1,765 square miles and a population of 299,350. There were 3 vaccinators, and another is required in the Sávantvádi State. Those primarily vaccinated and revaccinated were respectively 9,677 and 1,120, and the successful cases were 9,637 or 99·59, and 741 or 66·16 per cent. The protected were 34·37 per mille of population against 31·07 last year. Each vaccinator, on an average, operated on 3,599 persons. The total cost amounted to Rs. 1,083-2, and the average cost per each successful case was annas 1-8 against annas 1-10 last year. The Medical Officer of Sávantvádi Dispensary primarily vaccinated 345 persons and revaccinated 259.

Progress in the Presidency Circle.

73. The city of Bombay is the Presidency Circle. It has an area of 22 square miles, with a population of 773,196 souls. It was administered by a Superintendent of Vaccination paid by Government, who had under him an Assistant Superintendent, 3 clerks, 1 head vaccinator, 6 public vaccinators, and 2 assistants, 13 kárkúns and 3 peons, all paid by the municipality. There were 22,403 primary vaccinations and 14,452 revaccinations against 17,949 and 920 last year. The successful cases were respectively 20,735 and 12,056, or 92·55 and 83·42 per cent. The rate per mille of population protected was 42·41 against 22·82 last year. Each vaccinator vaccinated 4,607 persons. The total cost was Rs. 18,811-8-7½, or annas 9-2 per each successful case: last year it was annas 14-7. Vaccination was practised by the Medical Officers in the House of Correction and Common Jail. They primarily vaccinated 4 and revaccinated 338 persons. There were 1,128 deaths against 31 last year.

Progress in the Eastern Gujarát Registration District.

74. The Eastern Gujarát Registration District comprises the collectorates of Surat, Broach, Kaira, Panch Mahál and Ahmedabad and the Native States of Mahi Kántha, Rewa Kántha, Cambay, the Surat Agency and Jámbughoda. It has a population of 4,162,314 and an area of 27,722·075 square miles. It was administered by a Deputy Sanitary Commissioner, who had under him 5 Inspectors of Sanitation and Vaccination, 2 clerks, 6 municipal, 37 local fund and 20 Native State vaccinators and 70 peons. The area for each vaccinator was 440·033 square miles, with a population of 66,063. Fifteen more vaccinators are required—8 for town circles, 1 for a rural circle, 3 for 3 of the more populous tálukas, and 3 for the Native States of Lúnávada, Sunth and Kadána. Out of 120,477 primary vaccinations and 2,264 revaccinations there were 116,536 or 96·73, and 1,196 or 52·88 per cent., successful. Last year the numbers primarily vaccinated and revaccinated were respectively 108,191 and 873. The protected were 28·29 per mille of population: last year they were 25·33. Each vaccinator vaccinated 1,948 persons. The total expenditure was Rs. 36,392-9-3, and the average cost per each successful case was annas 4-11, whilst last year it was annas 5-3. In 24 dispensaries 3,730 persons were primarily vaccinated and 52 were revaccinated. The deaths were 1,081 against 13 last year.

Surat Collectorate.

75. The collectorate of Surat has 9 vaccinators, and 3 more are required —1 between the more populous tálukas of Mánelvi and Bárdoli, and 1 in each—Surat city and Bulsár town. The latter has lately been sanctioned by the municipal committee. Each vaccinator had, on an average, a population of 68,244 souls and an area of 184·7 square miles. The number of persons primarily vaccinated was 19,742, and the successful cases were 18,937, or 95·92 per cent. The number of persons revaccinated was 399, and the successful cases were 148, or 37·09 per cent. Protection was afforded to 31·07 out of every 1,000 of population: last year the rate was 23·49. Each vaccinator, on an average, operated on 2,238 persons. The total cost was Rs. 2,802-1-0, and the average cost per each successful case was annas 2-4, whilst in the preceding year it was annas 3-1. In 8 dispensaries 1,087 persons were primarily vaccinated and 27 were revaccinated. There were 943 deaths, and last year there were 7.

Broach Collectorate.

76. The collectorate of Broach had 6 vaccinators. Two additional vaccinators are wanted for the town of Jambusar and for the Hánsot Petha. Each vaccinator had, on an average, a population of 54,488 souls and an area of 242·2 square miles. The primarily vaccinated were 10,600 and the revaccinated were 228. Of these the successful cases were 10,035 and 113 respectively, or 94·67 and 49·56 per cent. The rate of protection per 1,000 was 31·04 against 23·52 last year. Each vaccinator vaccinated 1,805 persons, and the average cost per each successful case was annas 2-11 calculated on the total cost of Rs. 1,842-4-11 : last year each successful case cost annas 3-9. In 4 dispensaries 369 persons were primarily vaccinated and none were revaccinated. There were 75 deaths, whilst last year there were 2.

Kaira Collectorate.

77. The Kaira Collectorate has 9 vaccinators, and 5 more are required—1 in each of the towns of Kaira, Borsad and Kapadvanj and 1 each for the tálukas of Nadiád and Borsad. Each vaccinator had, on an average, a population of 89,422 souls and an area of 178·7 square miles. Out of 20,569 persons primarily vaccinated and 76 revaccinated 20,061 or 97·53, and 47 or 61·84 per cent. were successfully operated on. The protected were 24·98, and in 1881-82 they were 23·64 per 1,000 of population. Each vaccinator, on an average, vaccinated 2,294 persons. The total cost amounted to Rs. 2,788-5-4, or annas 2-3 per each successful case : last year it was annas 2-5. In 6 dispensaries there were 1,375 persons primarily vaccinated and none revaccinated. There were 5 deaths : last year there was only 1.

Panch Maháls.

78. The Panch Maháls have 5 vaccinators, and 2 others are required for the towns of Godhra and Dohad. Each vaccinator had, on an average, a population of 51,096 souls and an area of 322·3 square miles. There were 7,924 primary vaccinations and 210 revaccinations. Of these the successful were 7,736 and 120, or 97·62 and 57·14 per cent. The rate of protection per mille of population was 30·75, and in the preceding year it was 29·94. Each vaccinator vaccinated 1,627 persons. The total expenditure was Rs. 1,534-15-4, or annas 3-2, the same as in 1881-82. The Medical Officer of Godhra Dispensary primarily vaccinated 318 and revaccinated 5 persons. There was only 1 death last year, whilst this year there were 5 deaths.

Ahmedabad Collectorate.

79. The Ahmedabad Collectorate has 14 vaccinators, and 1 other is still wanted for the town of Gogha. Each vaccinator had, on an average, a population of 61,166 souls and an area of 272·9 square miles. There were 27,425 persons primarily vaccinated and 1,252 revaccinated. The successful cases were 26,401 and 691, or 96·27 and 55·19 per cent. The rate of protection per mille of population was 31·64 against 28·45 in the previous year. Each vaccinator vaccinated 2,048 persons. The total cost was Rs. 4,112-8-8. The average cost per successful case was annas 2-5 : last year it was annas 2-9. In 4 dispensaries 405 persons were primarily vaccinated and 3 revaccinated. There were 52 deaths, whilst last year there were 2.

Native States in the Eástern Gujarát Registration District.

80. The States of Mahi Kántha, Rewa Kántha, Cambay, the Surat Agency and Jámbughoda have a collective area of 17,378·375 square miles and a population of 1,282,422 souls. In Sachin and Jámbughoda States vaccination is performed by the vaccinator of the Chorási Táluka of the Surat Zilla, and in the latter by the vaccinator of Hálol, Panch Maháls. There were 20 vaccinators employed in all these States, and 3 more are required—1 in each of the States of Lúnáváda, Sunth and Kadána. The numbers of primarily vaccinated were 33,259 and those revaccinated were 87 ; of these 32,497 and 70, or 97·56 and 80·46 per cent., were successfully operated on. Protection was afforded to 25·36 per mille of population : last year the rate was 24·71. Each vaccinator, on an average, operated on 1,667 persons. The local fund vaccinators in Sachin and Jámbughoda vaccinated 958 and 12 persons under each kind of operation ; of these 919 or 95·93 and 7 or 58·33 per cent. were successfully operated on. Protection was afforded to 41·79 persons per 1,000 of population against 27·34 in the preceding year. The total cost in all the States was Rs. 5,106-0-6, or annas 2-6 against annas 2-5 last year, per each

successful case. The Medical Officer of the Sádra Dispensary, in Mahi Kántha States, primarily vaccinated 176 persons and revaccinated 17.

Progress in the Western Gujarát Circle.

81. The Western Gujarát Circle comprises the Native States of Káthiawár and Pálanpur. It has an area of 27,256·48 square miles and a population of 2,920,377 souls. It was administered by a Superintendent of Vaccination, who had under him 2 Assistant Superintendents, 2 clerks, 2 Government and 41 Native State vaccinators and 49 peons. The average number of square miles for each vaccinator was 633·87 and the average population of his area 67,916. Vaccination was carried on in 10 dispensaries. Two more vaccinators and 1 candidate are still required in the States of Pálanpur. The number of primary vaccinations and revaccinations were respectively 97,311 and 2,443 against 96,048 and 2,320 in the preceding year. The successful cases were 90,541 and 1,774, their percentages being 93·04 and 72·61. The rate of protection was 31·61 per 1,000 of population: last year it was 31·24. Each vaccinator vaccinated 2,320 persons. The total cost was Rs. 29,458-14-4, or annas 5-1 per each successful case. In the preceding year it was annas 5-5. In dispensaries there were primarily vaccinated 1,694 persons, and 121 were revaccinated.

Province of Káthiáwár.

82. The States of Káthiáwár have a collective area of 19,256·48 square miles and a population of 2,343,899. There were 36 vaccinators, who primarily vaccinated 81,371 persons and revaccinated 2,030. The successful cases were 75,669 and 1,409, or 92·99 and 69·41 per cent. Protection was afforded to 32·88 per 1,000 of population against 31·91 last year. The average per each vaccinator was 2,317 operations, and the average cost per each successful case was annas 2-9 calculated on the total cost of Rs. 13,408-10-2: last year the average cost was annas 2-8. In 10 dispensaries 1,694 persons were primarily vaccinated and 121 revaccinated.

Pálanpur States.

83. The Pálanpur States have an area of 6,041 square miles and a population of 576,478 souls. There were 7 vaccinators, and 2 more are required, as also a candidate vaccinator. The number of persons primarily vaccinated was 17,169, and that of the revaccinated was 726. The successful cases were 15,940 and 413, or 93·30 and 88·38 per cent. The rate of protection per mille of population was 26·43 against 28·49 in the preceding year. The average work per each vaccinator was 2,336 persons. The total cost was Rs. 2,051-2-6, or annas 2-2 per each successful case: last year it was annas 2-0.

Progress in the Sind Registration District.

84. The Sind Registration District comprises the collectorates of Karáchi, Hyderabad and Shikárpur, the Thar and Párkar, the Upper Sind Frontier and the Khairpur State. It has an area of 54,123·01 square miles and a population of 2,542,976. It was administered by a Deputy Sanitary Commissioner, who had under him 1 Superintendent of Vaccination, 6 Inspectors of Sanitation and Vaccination, 2 clerks, 6 municipal, 49 local fund and 3 Native State vaccinators and 67 peons. Four more are required at the rate of 1 for each rural circle in the Karáchi Collectorate and 1 in the Khairpur State. Vaccination was caried on in 19 dispensaries. Each vaccinator had an area of 933·16 square miles, with a population of 43,844 souls. Those primarily vaccinated numbered 81,563, and the revaccinated were 29,652, against 85,458 and 37,744 in the preceding year. The successful cases were respectively 77,941 and 20,612. The rates of success were 95·56 and 69·51 per cent., and that of protection was 38·75 per 1,000 of population. It was 43·42 last year. Each vaccinator on an average vaccinated 1,917 persons. The total cost was Rs. 44,511-5-1, and for each successful case it was annas 7-3, or 1 anna and 2 pies more than last year. There were 2,414 persons primarily vaccinated and 436 revaccinated by Medical Officers of 19 dispensaries. There were 463 deaths against 315 in the previous year.

Karáchi Collectorate.

85. The Karáchi Collectorate has 11 vaccinators, and 4 more are required, so as to have 1 for each rural circle. Each vaccinator had, on an average, a population of 43,517 souls and an area of 1,283·22 square miles. The number primarily vaccinated was 15,940 and the revaccinated were 6,318. The successful cases were respectively 15,400

and 4,512 or 96·61 and 71·41 per cent., whilst 41·60 per 1,000 of population were protected: last year the rate was 39·93. Each vaccinator vaccinated 2,023 persons. The total cost was Rs. 4,000-10-5, or annas 3-3 per each successful case: in the preceding year it was annas 3-4. In 5 dispensaries 525 persons were primarily vaccinated and 64 were revaccinated. The deaths were 153 against 98 in the previous year.

Hyderabad Collectorate.

86. The Hyderabad Collectorate has 14 vaccinators, each of whom had, on an average, a population of 53,902 souls and an area of 644·97 square miles. There were 21,448 persons primarily vaccinated and 4,417 revaccinated; of these 20,507 or 95·61 and 3,049 or 69·03 per cent. were successfully operated on. The rate of protection per mille of population was 31·22: last year it was 36·89. Each vaccinator, on an average, vaccinated 1,847 persons. The total cost amounted to Rs. 5,223-14-6, which gives annas 3-7 as the cost per each successful case, or 1 anna and 1 pie more than last year. In 7 dispensaries 626 persons were primarily vaccinated and 81 were revaccinated. There were 284 deaths against 35 in the preceding year.

Thar and Párkar.

87. The Thar and Párkar had 7 vaccinators, each of whom had, on an average, a population of 29,049 souls and an area of 1,818 square miles. They primarily vaccinated 10,359 and revaccinated 5,594 persons. The successful cases were 10,065 or 97·16, and 3,918 or 70·04 per cent. The protected were 68·77 per 1,000 against 76·32 in the preceding year. Each vaccinator, on an average, vaccinated 2,279 persons. The total cost was Rs. 2,692-1, or annas 3-1 per successful case: last year it was annas 2-6. In 4 dispensaries 246 persons were primarily vaccinated, and 15 were revaccinated. There were 8 deaths, and last year there were 2.

Shikárpur Collectorate.

88. The Shikárpur Collectorate has 20 vaccinators, each of whom has, on an average, a population of 42,649 souls and an area of 500·04 square miles. They primarily vaccinated 26,943 and revaccinated 11,778 persons. The successful cases were 25,484 or 94·58, and 8,163 or 69·30 per cent. The protected were 39·45 per mille of population against 46·46 in the preceding year. Each vaccinator vaccinated 1,936 persons. The total cost was Rs. 7,439-14-1, or annas 3-6 per each successful case: last year it was annas 2-10. In 2 dispensaries there were 334 persons primarily vaccinated and 241 revaccinated. There were 18 deaths against 158 last year.

Upper Sind Frontier.

89. The Upper Sind Frontier has 3 vaccinators, each of whom has, on an average, a population of 41,394 souls and an area of 713·6 square miles. They primarily vaccinated 4,023 persons and revaccinated 1,541. The successful cases were 3,741 and 966, or 92·99 and 62·69 per cent. The rate of protection per mille of population was 37·90, and last year it was 68·74. The average number of operations for each vaccinator was 1,855, and the cost of each successful case was annas 4-1, calculated on the total cost of Rs. 1,196-6-2. In the preceding year each successful case cost annas 2-8. There were no deaths this year: last year there were 22.

Khairpur State.

90. The Khairpur State has an area of 6,109 square miles and a population of 129,153 souls. It has 3 vaccinators. They primarily vaccinated 2,850 and revaccinated 4 persons; of these 2,744, or 96·28 per cent., were successfully vaccinated. The 4 cases of revaccinations were all successful. The protected were 21·28 per mille of population: last year they were 22·13. Each vaccinator, on an average, vaccinated 951 persons. The total cost was Rs. 1,317, or annas 7-8 per each successful case against annas 4-10 in 1881-82.

Progress in the Baroda Circle.

91. The States of Baroda have a population of 2,185,005 and an area of 8,570 square miles. It was administered by the chief Medical Officer of those States, who had under him 3 Inspectors, 31 vaccinators and 34 peons. Each vaccinator has, on an average, 276 square miles and a population of 70,484. There were 63,933 persons primarily vaccinated and 249 revaccinated against 63,773 and 235 in 1881-82. The successful cases were 61,941 and 170, or 96·57 and

68·27 per cent. The rate of protection per mille of population was 28·33 : last year it was 28·38. Each vaccinator vaccinated 2,070 persons. The total cost was Rs. 11,838-1-2, or annas 3-1 per each successful case—same as last year. Vaccinations were performed in 19 dispensaries, whilst last year it was carried on in 20. In these dispensaries 3,745 persons were primarily vaccinated.

Progress in the Cutch Circle.

92. The State of Cutch has a population of 512,084 in an area of 6,500 square miles. It was administered by the Medical Officer to H. H. the Ráo of Cutch, who had under him an Assistant Superintendent of Vaccination, 17 vaccinators and 19 peons. Each vaccinator has an average population of 30,123 and an area of 382 square miles. The number of persons primarily vaccinated was 20,619 and that of the revaccinated was 339, against 18,936 and 86 last year. The successful cases were 20,479 and 240, or 99·32 and 70·80 per cent. The rate of protection per mille of population was 40·46 : last year it was 36·67. Each vaccinator operated, on an average, on 1,233 persons. The total expenditure was Rs. 7,705-3-11, and the average cost per each successful case was annas 6-0 : in the preceding year it was annas 6-7.

Progress in Aden.

93. Aden has an area of 11·6 square miles and a population of 34,860. The municipality defrays the cost of 1 vaccinator and 1 peon. This vaccinator works under the supervision of the Civil Surgeon. There were 598 persons primarily vaccinated and 5 revaccinated against 1,230 and 17 in the preceding year. Of the primary vaccinations 419, or 70·07 per cent., were successful, and of the revaccinations 2 were unsuccessful and 3 unknown. The rate of protection afforded was 12·02 per 1,000 of population : last year it was 26·48. The total cost was Rs. 410, and the average cost per each successful case was annas 15-8 : in the preceding year it was annas 6-10.

Progress in Bassadore, Muscat and Bushire.

94. In Bassadore the work was carried on by the Dispensary Medical Officer, and in Muscat by the Civil Surgeon. In Zanzibar there were no operations this year. There were only 7 primary vaccinations in Bassadore, and 271 in Muscat, against 6 and 133 in the preceding year. The successful cases were 3 or 42·86 per cent. in the former, and 256 or 94·46 per cent. in the latter. In the Residency Dispensary, Bushire, there were 88 persons primarily vaccinated against 32 in 1881-82. Of the 88 cases 76 were successful, or 86·36 per cent.

Tour of Deputy Sanitary Commissioners and Superintendent of Vaccination.

95. (*a*). In the Northern Deccan Registration District the Deputy Sanitary Commissioner went through the táluka of Igatpuri in Násik; the Karjat and Jámkhed tálukas of Ahmednagar; the tálukas of Khed, Mával, Indápur, Bhimthadi and Haveli in Poona; and all the tálukas in Sholápur Zilla and the Native State of Akalkot. Khándesh was not visited this year. He travelled over 1,295 miles in 134 days, visited 182 villages, and inspected 8,525 children.

(*b*). In the Southern Deccan the Deputy Sanitary Commissioner went through all the tálukas of Belgaum except Sampgaon, Parasgad and Athni; all the tálukas of Dhárwár, except Navalgund, Ránebennur, Kod and Ron; and all the tálukas of Sátára except Mán, Koregaon and Málcolm Peth. Kaládgi was not visited this year. The Native States he passed through were Savanúr, Sángli, Kurundvád, Miraj, Bhor, Kágal, Shirol and Kolhápur. The total number of children inspected was 10,189 in 163 villages. The number of miles travelled was 1,910½ in 130 days.

(*c*). The Deputy Sanitary Commissioner of the Konkan Registration District passed through the tálukas of Kárwár, Akola, Kumta, Honávar and Bhatkal in Kánara; all the tálukas of Ratnágiri, except Devgad and Rájápur; all the tálukas of Kolába and the tálukas of Dahánu, Karjat, Panvel and Sálsette of Thána Zilla. He passed through the Native States of Sávantvádi and Janjira. He inspected 4,187 children in 94 villages. The number of miles travelled was 2,905 in 135 days.

(*d*). The Deputy Sanitary Commissioner in the Eastern Gujarát Registration District went through all the tálukas of Surat except Bulsár, Mándvi and

Bárdoli; the tálukas of Broach, Amod, Anklesvar and Hánsot in Broach; all the tálukas, except Mátar, in Kaira; and the tálukas of Dholka, Dhandhuka, Viramgám, Sánand and Ahmedabad city in Ahmedabad Zilla. Panch Mahál were not visited this year. He also went through the Native States of Sachin and Cambay. He travelled over 2,616 miles in 150 days, and saw 8,243 children in 326 villages.

(*e*). In the Western Gujarát Circle the Superintendent of Vaccination went through the States of Limbdi, Jhinjhuváda, Sáyla and Jasdan in the Jhálávad Pránt; and the States of Khambáliya, Bhanwád, Dhráphа and Rájkot in the Hálár Pránt. The Sorath and Gohelwád pránts were not visited this year. The States of Pálanpur were visited this year all throughout, as they were not visited since 1879. He travelled over 782 miles in 78 days, and inspected 12,462 children in 185 villages.

(*f*). In Sind the Deputy Sanitary Commissioner went through the tálukas of Dádú, Tatta, Sujáwal, Mirpur Batoro, Kotri and Karachi town of the Karáchi Collectorate; the tálukas of Tando, Bago-jo-Tando, Badin, Dero Mohbat, Hyderabad and Alahyar-jo-Tando in the Collectorate of Hyderabad; all the talukas of Thar and Párkar, except Sanghar, Khipra and Chách ra; and the tálukas of Naushahro, Rato-dero, Lárkhána, Tigar and Shikárpur town in the Shikárpur Collectorate. The Upper Sind Frontier and Khairpur State were not visited. He inspected 9,320 children in 164 villages, and travelled over 1,276 miles in 57 days. The 5 Deputy Sanitary Commissioners and the Superintendent of Vaccination have visited all the districts, except Khándesh, Kaládgi, Panch Mahál and Upper Sind Frontier. The Native States that were not visited this year are Mudhol, Rámdurg, Jamkhandi, Jawhár, Dharampor, Bánsda, Jámbughoda, Mahi Kántha, Rewa Kántha and the Khairpur States. There were collectively 300 encampments, 684 travelling days, 10,784½ miles travelled, 1,114 villages visited, and 52,926 children inspected.

The Bombay Vaccination Act No. I of 1877.

96. The Compulsory Vaccination Act (I of 1877) has been in force for 5 years, and it is worked fairly well. The following table shows the progress in the infants protected during the last 7 years, the first 2 being before, and the last 5 after, the introduction of the Act:—

	Years.	Births returned as having been registered.	Deaths registered among Children under 1 year old.	Children available for Vaccination.		Children under 1 year successfully vaccinated.		
				Births minus Deaths.	At the rate of 31 per 1,000 of Population.	Number.	Ratio per 100 on those in Column 4.	Ratio per 100 on those in Column 5.
Before the introduction of the Act	1876-77	13,466	6,179	7,287	19,977	9,840	135·03	49·26
	1877-78	13,720	7,781	5,939	19,977	7,212	121·43	36·10
After the introduction of the Act.	1878-79	13,896	6,417	7,479	19,977	6,558	87·69	32·83
	1879-80	14,341	5,274	9,067	19,977	7,925	86·30	39·17
	1880-81	16,997	6,104	10,893	19,977	10,416	95·62	52·14
	1881-82	16,381	6,279	10,102	23,969	12,017	237·27	50·14
	1882-83	15,094	5,720	9,374	23,969	14,940	159·38	62·33

There were 1,343 persons prosecuted under the Vaccination Act, of whom 1,000 were instances of neglecting to have the children vaccinated and 343 for not bringing the children vaccinated for inspection. The fines inflicted by the Magistrate amounted to Rs. 1,009. Dr. Ananta Chandroba and all the members of his establishment have taken great pains in coping with the epidemic of small-pox, which has now entirely disappeared, and in obtaining such good results.

Karáchi Vaccination Act.

97. This is the third complete year in which the Karáchi Vaccination Act (No. IV of 1879) has been worked in that city, and it will be seen from the following table that a great improvement has been effected in the quality of the work performed over that of last year :—

Persons primarily vaccinated.								Total Number of Persons operated on. P. = Primary Vaccinations R. = Revaccinations.			Results.				Excess of Operations over Persons.
Caste.					Age. N.—Number. S.—Successful.			Sex.		Total.					
Christians.	Hindus.	Musalmans.	Pársis.	Other Castes.	Under 1 year.	Between 1 and 6 years.	All other ages.	Males.	Females.		Successful.	Unsuccessful.	Unknown.	Total.	
					For the year 1881-82.										
124	1,131	2,280	45	110	N. 2,523 S. 2,516	879 872	288 284	P. 1,906 R. 866	1,784 99	3,690 965	3,672 627	37 297	10 54	3,719 968	29 3
								2,772	1,883	4,655	4,299	334	64	4,687	32
3·36	30·65	61·79	1·22	2·98	N. 68·37 S. 68·18	23·82 23·63	7·81 7·70	P. 51·63 R. 89·74	49·35 10·26	100 100	99·51 64·97	0·22 29·43	0·27 5·60	100·79 100·21	0·79 0·21
								50·55	49·45	100	92·35	6·28	1·37	100·69	0·69
					For the year 1882-83.										
133	1,032	3,407	54	68	N. 2,841 S. 2,827	1,008 1,007	335 833	P. 2,470 R. 1,788	2,274 628	4,744 2,416	4,727 2,015	48 334	13 67	4,788 2,416	44 ..
								4,258	2,902	7,160	6,742	382	80	7,204	44
2·80	22·81	71·82	1·14	1·43	N. 59·89 S. 59·59	22·51 22·49	17·60 17·56	P. 52·07 R. 74·01	47·93 25·99	100 100	99·64 83·40	0·08 13·82	0·28 2·77	100·93 100·	0·93 ..
								59·47	40·53	100	94·16	4·72	1·12	100·62	0·62

Suggestions for the more effectual spread of Vaccination.

98. The Superintendent of Vaccination, Presidency Circle says that during the epidemic periods, or on other occasions, when extra hands are required as vaccinators to be entertained to carry on vaccinations, it is very difficult to have them ready at hand, because vaccinations in Bombay City "are carried on with animal lymph, and this to be properly and efficiently used requires a previous training of, at least, two or three months, and this, too, in the case of a well-qualified practised vaccinator of some standing. There is no vaccinator so qualified. Indeed, we had not even a candidate whom we could utilize. I would suggest that the candidate vaccinators of the whole department should be, in the first instance, attached to our department for the period of six months to study animal vaccination and be properly otherwise trained as vaccinators, and when well qualified drafted to fill the vacancies in the different registration districts and circles as they occurred. This arrangement would not only be of great use, but would be of great utility in preparing a class of good vaccinators who, no doubt, would be able to improve the efficiency of the whole Vaccination Department." I fully endorse this suggestion. Dr. Peacocke, the acting Deputy Sanitary Commissioner, Sind Registration District, has also suggested forming a class for teaching vaccination at Karáchi; and Dr. Colah, of the Eastern Gujarát Registration District, is trying his utmost to establish animal vaccination in Gujarát. Dr. Tully, the acting Superintendent of Vaccination, Western Gujarát Circle, intends obtaining animal lymph before next cold season.

He is now trying to improve the state of vaccination in the Pálanpur States, where he found the work bad and much neglected and the establishment badly paid, and to open a vaccination fund like that in the Káthiáwár States; and he says that the Political Superintendent looks favourably on the proposal.

The Political Agent of Káthiáwár has also been addressed on the subject of the introduction of the system of the registration of births and deaths in those States where "the greatest obstacle is said to be ignorance of patels, which does not appear to be insurmountable as long as there are Baniás in the village."

A proposal has also been made to the two Political Agents "with reference to Government Resolution No. 3018, dated 23rd October 1877, General Department, to place the dispensaries" in the States of Káthiáwár and Pálanpur "under proper supervision, whereby cases would be properly registered, medicines not squandered, subordinates not employed who did not know at least something, and valuable statistics retained,—in fact, prevent many of them from bringing disgrace on the profession and producing want of confidence by the people."

Dr. Peacocke, the Acting Deputy Sanitary Commissioner, Sind Registration District, attributes the decrease in revaccinations to a great extent to the unwillingness on the part of adult females to submit to the operation. He says that "something might, however, be done by appointing female vaccinators. The Mehar Municipal Commissioner paid a woman, who had been taught by the Hospital Assistant there, for each operation which she did. The fee was small, and the women, I was told by the late Deputy Collector in charge, did not object to the same extent."

SECTION IV.

SANITARY WORKS—MILITARY.

This section consists of extracts taken from the annual Cantonment reports of the Executive Engineers in charge of military stations.

The actual outlay on sanitary works (Military) during 1882 amounted to Rs. 1,19,036; of this sum Rs. 37,859 were spent at Ahmedabad, of which Rs. 36,977 were for constructing a hospital for British troops. At Aden Rs. 14,752 were expended, of which Rs. 3,796 were for providing huts for infectious disease cases at Steamer Point; Rs. 2,052 for improving the Sanitarium Hospital at Steamer Point; Rs. 4,020 for re-constructing lower male ward, European Infantry Hospital, and Rs. 3,730 for re-constructing female ward of European Infantry Hospital. At Poona Rs. 13,755 were spent, of which Rs. 5,352 were for improving the slaughter-yard at Wanouri; Rs. 3,199 for converting the old guard-room and cells in the old Horse Artillery lines into quarters for the Farrier Major Assistant at the Poona Army Veterinary School, and Rs. 1,662 for preserving and watering trees that have been planted in connection with sanitary improvements to Ghorpuri barracks. At Mhow Rs. 12,722 were expended, of which Rs. 1,956 were for constructing 2 wards for contagious disease for camp followers and Staff Hospital; Rs. 2,170 for providing pipes and cocks to the wash-houses of cavalry barracks and quarter guard; and Rs. 2,747 for fixing pipe in the wash-houses in the European Infantry lines. At Mount Abu Rs. 9,427 were spent, of which Rs. 7,616 were for adding a coat of asphalte to certain of the floors of the military buildings.

The following table shows the total amount spent on sanitary works (Military) at each station during the year under report:—

Stations.	Actual Outlay.	Stations.	Actual Outlay.
Poona	13,755	Mhow	12,722
Kirkee	300	Indore	...
Ahmednagar	...	Asirgarh...	...
Sholápur...	...	Mehidpur	...
Málegaon	...	Neemuch	565
Sátára	134	Nasirabad	3,316
Sirúr	235	Augar	...
Purandhar	3,136	Belgaum	611
Khandála	1,645	Dhárwár	...
Ahmedabad	37,859	Kolába	4,480
Deesa	4,158	Bombay	1,224
Mount Abu	9,427	Devláli	2,160
Baroda	3,748	Karáchi	1,011
Rájkot	2,107	Hyderabad (Sind)	1,275
Bhúj	...	Jacobabad	435
Surat	...	Aden	14,752

POONA DIVISION OF THE ARMY.

Stations.—Poona, Kirkee, Ahmednagar, Sholápur, Málegaon, Sátára, Sirú'r, Purandhar and Khanda'la.

POONA.

Lieutenant-Colonel Ducat, R.E., Executive Engineer, Poona and Kirkee, states that the following sanitary works were carried out during 1882:—

Removing the prickly-pear hedge, and building a dry rubble stone wall in its stead round the Hospital of the Centre Lines, Native Infantry.—On the north side there was a dry rubble

stone wall, also small portions of a wall on the east and west sides; the rest of the enclosure was of prickly-pear hedge; this has been removed, and a dry rubble stone wall substituted. The total length of the wall built during the year is 721 feet, average height being 2½ feet.

Estimated cost	...	...	...	... Rs. 464
Actual outlay	...	...	...	... „ 351

Removing the prickly-pear hedge and building a dry rubble stone wall in its stead round the Hospital of the Left Flank, Native Infantry Lines.—The prickly-pear hedges on the north, east and west sides of the Hospital have been removed, and dry-rubble stone walls substituted. The total length of the walls built is 610 feet, average height being 3 feet.

Estimated cost	...	...	...	... Rs. 498
Actual outlay	...	...	...	... „ 283

Supplying round tiles to be laid down for the purpose of conveying sullage water from the washing places in the pendalls of the Left Flank, Native Infantry Lines.—The sullage water, which used to run out and saturate the ground close by the lines, is now carried away from the washing places in the verandahs of the pendalls to a distance of about 10 feet from them by semi-cylindrical tile drains, and is discharged into a general cut or gutter made in the ground in front of the lines.

For the above work 8,000 tiles were supplied by this department; they were laid by the men of the regiment.

Estimated cost	...	...	...	... Rs. 76
Actual outlay	...	...	...	... „ 73

Constructing a wall in front of the Staff Serjeants' Quarters Nos. 2, 3, 4 and 5 in the Petty Staff Lines.—The prickly-pear hedge in front of these buildings has been removed and a dry rubble stone wall constructed 14 feet from the road kerbing, so as to enclose the spare ground in front, and enlarge the compounds. The total length of the wall is 479 feet. Height 2½ feet.

Estimated cost	...	...	...	... Rs. 200
Actual outlay	...	...	...	... „ 200

Fitting up shower baths in the two private ablution rooms of the wash-house in the Military Prison.—Shower baths have been fitted up in the two private ablution rooms of the lavatory in the Military Prison.

Estimated cost	...	...	...	... Rs. 26
Actual outlay	...	...	...	... „ 25

Enclosing with bamboo matting and teak framed walling a portion of the open working shed within the enclosure of the Military Prison.—A length of 30 feet at the south end of the open working shed in the Military Prison has been temporarily portioned off and enclosed so as to form a lavatory. A teakwood wash-hand stand complete with metal basins has also been furnished.

Estimated cost	...	...	... Rs.	131 0 0
Actual outlay	...	...	... „	130 9 4

Carrying out certain improvements to the Bázár Slaughter-yard at Wanouri.—The existing paved slaughter-stand has been roofed over with corrugated iron, and a masonry wall constructed at its west end which is exposed to the monsoons. Water has been laid on, and a masonry trough provided for washing purposes.

A new cut-stone pavement slaughter-stand for sheep, 50′ × 18′, with teakwood gallows covered by a corrugated iron roof has also been constructed with water trough and water-supply similar to above.

Each of the two slaughteries has been enclosed by a masonry wall 5 feet high with teakwood barred gates,—the enclosures measuring, respectively, for cattle and sheep 153′ × 149′ and 150′ × 149′.

The slaughter-yards have been connected to the main road by a cleared track, 12′ wide and 993′ long, formed of 6″ embankment, consolidated and spread with gravel.

Estimated cost	...	...	... Rs.	5,815 0 0
Actual outlay	...	...	... „	5,352 6 11

Providing ventilators in the walls of the School-Master's quarters at Wanouri.—Fourteen openings, 6″ × 6″, for ventilation have been pierced in the main wall of the School-Master's quarters under the eaves of the roof. These openings have been protected on both faces by wire netting.

Estimated cost	...	...	... Rs.	29 0 0
Actual outlay	...	...	... „	27 14 8

Substituting cut-stone pavement for existing moorum floors in the verandah of Right Flank Hospital at Wanouri.—The verandahs of the east and west wards of the Right Flank Hospital have been paved with cut stone.

Estimated cost	...	...	... Rs. 870	0 0
Actual outlay	...	...	... „ 869	9 7

Converting the old guard-room and cells in the old Horse Artillery Lines at Poona into quarters for the Farrier Major Assistant at the Poona Army Veterinary School.—The guard-room in the old Horse Artillery lines, Wanouri, has been converted into quarters for the Farrier Major Assistant at the Army Veterinary School, Poona, and now affords the following accommodation :—a sitting-room 16′×16′, two bed rooms respectively 18′-6″ × 16′ and 12′-10″×16′, and a dressing room 16′×10′. The front and rear of the building are protected by verandahs. Portions of the rear verandah, which has now been added, are enclosed with stone and lime masonry walls so as to form a dining room 16′-9″×9′-3″, a dressing room 13′-6″×9′-3″, and a bath-room 11′-6″×9′-3″.

A block of permanent out-houses has been provided to the quarter containing two servants' quarters, each 8′×10′, a cook-room 10′×7′-4″, and a stable 10′×10′.

Estimated cost	...	...	... Rs. 3,200	0 0
Actual outlay	...	...	... „ 3,199	11 6

Ventilating the liquor store-room and caterer's room of the Serjeants' Mess in the Wanouri Lines.—The windows of the liquor-room of the Serjeants' Mess, Wanouri, have been protected with iron bars so as to obviate the necessity of having to close the shutters, and thus admit ventilation into the room. Ridge ventilators of fixed louvres have also been provided to the liquor-room and to the adjoining room occupied by the mess caterer.

Estimated cost	...	...	... Rs. 101	0 0
Actual outlay	...	...	... „ 100	12 2

Constructing a cut-stone sink for washing urinals and other filth receptacles within the Central Military Prison enclosure.—A cut-stone sink 30′×9′-3″, surrounded by a coping 6″ high, has been provided within the Military Prison compound at Wanouri. The sink is intended for the washing of filth receptacles and also for conveying the urine out of the prison. The bottom of the sink has a fall of 6″ towards the centre, where the urine escapes into a cut-stone gutter by which it is carried to a prepared bed of earth, 21 feet square and about 18 inches deep. The sink is flooded by means of a perforated pipe passing round its outer edge while urine is being emptied into it.

Estimated cost	...	...	... Rs. 473	
Actual outlay	...	...	... „ 473	

Constructing a dark cell to be used for punishment in the Military Prison, Poona.—The cell is of burnt brick and lime masonry, and measures internally 10′×10′, and is 13 feet high from the floor to the ceiling. The building is covered by a double tiled roof, and the walls are protected from the sun by single tiled sunshades. The floor is of cut stone and the door is of double block panelled shutters with suitable fastenings. A privy pan with opening for the same in the wall is provided. Ventilation is admitted by two rows of zig-zag openings 4½″×9″, one row at top and the other at the bottom of the walls, also by a 6″ fresh-air-inlet-pipe and a ridge ventilator. Light is prevented by suitable contrivances from entering the cell by the ventilator and other openings.

Estimated cost	...	...	... Rs. 1,040	
Actual outlay	...	...	... „ 1,007	

Preserving and watering trees that have been planted in connection with sanitary improvements to Ghorpuri Barracks.—The trees that have been planted in connection with the sanitary improvements to the barracks at Ghorpuri have been tended and watered during the past year.

Fresh plants have been substituted for those that have died or been eaten by cattle.

Estimated cost	...	...	... Rs. 1,666	
Actual outlay	...	...	... „ 1,662	

KIRKEE.

Lieutenant-Colonel Ducat, R.E., Executive Engineer, Poona and Kirkee, reports that the following sanitary works were undertaken during the year 1882 :—

Special repairs to the floors of the Artillery stables.—The floors of the two south stables occupied by A Battery, 2nd Brigade R. A., have been re-made; all the metal has been removed and hard moorum spread in place of it, which has been watered and coated with sand, &c.

Estimated cost	...	...	... Rs. 131	0 0
Actual outlay	...	...	... „ 126	12 5

Removing and repairing portions of the stable floors occupied by A Battery, 2nd Brigade R. A.—Portions of the floors of the stables which have become saturated with urine have

been removed to a depth of 6", and fresh hard moorum has been filled in, watered and consolidated, after which a layer of sand has been spread over the surface of floors, and well beaten down.

Estimated cost	...	...	... Rs. 106 0 0
Actual outlay	...	...	... „ 102 14 6

Current repairs to Ordnance Buildings at Kirkee (Powder Works Buildings).—Two hundred running feet of round tile drains have been laid in the native pendall of the Gunpowder Factory to prevent the dampness complained of.

Estimated cost	...	...	... Rs. 33 0 0
Actual outlay	...	...	... „ 32 10 3

Constructing a door in each of the two end quarters, one of which is occupied by Conductor C. Lacey and the second is to be occupied by another Warrant Officer of the small Arms Ammunition Factory at Kirkee.—Two arches in the wall, one in each of the two end quarters, have been pierced for a 4-feet doorway.

Estimated cost	...	...	... Rs. 38 0 0
Actual outlay	...	...	... „ 37 14 3

AHMEDNAGAR.

The Executive Engineer, Ahmednagar, states that no works under the head Sanitary were carried out during the year 1882.

SHOLA'PUR.

The Assistant Engineer, Sholápur, states that, as no troops are stationed here, no new work has been constructed during the year 1882.

MA'LEGAON.

Mr. D. Rutherford, C. E., Executive Engineer, reports that no sanitary work was undertaken during the year 1882.

SA'TA'RA.

Mr. C. Brereton, C. E., Executive Engineer, Sátára, reports that the following sanitary works were carried out during the year 1882 :—

Constructing a sentry-box at the unprotected corner of the Magazine.—A masonry sentry-box at the unprotected corner of the Magazine for the shelter of an additional sentry is being erected as required.

Estimated amount ...	...	...	... Rs. 70
Actual outlay up to 31st December 1882 ...			... „ 4

Removing debris and clearing the site of the Staff Sergeant's quarters and cooking-house.—Work completed.

Estimated amount ...	...	...	... Rs. 25
Actual outlay	...	...	... „ 25

Supplying uprights and pulleys for fixing moat to the well in the Golowdi Tank.—The well in the Golowdi Tank reserved for the use of the troops has been supplied with uprights and pulleys for convenience in drawing water.

Estimated amount ...	...	...	... Rs. 39
Actual outlay	...	...	... „ 39

Deepening two wells near the Native Infantry Lines.—In consequence of the quantity of water in the wells the work cannot be completed.

Estimated amount ...	...	...	... Rs. 464
Actual outlay up to 31st December 1882 ...			... „ 66

SIRU'R.

Mr. W. Howard, C.E., Executive Engineer, Poona District and Sholápur, reports that the following sanitary works were undertaken during the year 1882 :—

Constructing a road dam across a nála in the Cantonment at Siriir.—A road dam has been constructed across the nála which separates the drill ground from the Poona Horse Regimental Lines. The dam is 30' long by 2' 6" wide at the top and 3' 6" at bottom and 4' high, with a slope on the outer face of 1 in 4. The filling inside consists of large stones over which a layer of good sand has been spread and well rammed. A stone filling in front

of the dam has been provided to break the fall of water and prevent scour. The top of the masonry has a coping of roughly dressed stone.

Estimated cost	...	...	... Rs. 182 0 0
Actual expenditure	...	...	... „ 181 12 3

Constructing a slab drain in the Cantonment of Sirúr.—A small slab drain, 15″ by 15″, has been constructed to join the road lately made in front of the regimental lines with the Nagar road to enable carts to come into the regimental bázár and lines.

Estimated cost ..	* ...	...	... Rs. 54
Actual expenditure	...	...	... „ 54

PURANDHAR

Mr. Howard, C.E., Executive Engineer, Poona District and Sholápur, states that the following sanitary works were undertaken during the year under report :—

Constructing quarters for the Commissariat Overseer.—These quarters are required for the accommodation of the inspector and clerk in charge of commissariat duties. The building contains two rooms each measuring 12′ × 12′, with an open verandah in front 7′-6″ in width. A small bath-room as well as cook-room is provided for each set of quarter in rear of the main rooms and communicating with them and each other. The walls are 12′ in height, and stand on a plinth raised one foot above the ground. A detached latrine of the Kárwár pattern containing two seats, one for the use of each family, is also provided.

Estimated cost	...	...	... Rs. 1,977 0 0
Actual cost	...	...	... „ 1,976 15 7

Closing half the windows on the western side of the Sanitarium Hospital.—Much inconvenience was experienced during the monsoon in the hospital by rain beating in through the venetians and wooden shutters of all the large windows on the west verandah. The medical authorities proposed that the lower half of these large windows should be built up, the upper half being sufficient for purposes of ventilation.

Estimated cost	...	...	... Rs. 311 0 0
Actual cost	...	...	... „ 310 11 4

Construction of a shed for milch cattle in the Commissariat Lines.—Accommodation for milch cattle has been provided in a shed 63½′ × 6¼′ × 7′ high. The roofing is single tiled, and the floor is made of moorum well watered and rammed. The foundation plinth and superstructure are of stone, and mud walls chunam pointed outside and mud washed inside.

Estimated cost	...	...	... Rs. 529 0 0
Actual cost	...	...	... „ 528 15 9

Providing an iron railing round the eastern tank.—An iron railing has been provided round the tank. The standards are 4′ in height and 6′ apart, and carry 4 galvanized wires.

Estimated cost	...	...	... Rs. 301 0 0
Actual cost	...	...	... „ 300 8 1

KHANDA'LA.

Mr. Howard, C.E., Executive Engineer, Poona District and Sholápur, states that the following sanitary works were undertaken during the year 1882 :—

1.—*Weather frames to barracks ;*
2.—*Jamps to staging pendall ;*
3.—*Walls in harness room ;*
4.—*Teakwood saddle rests ;*

1. Frames of junglewood with bamboo matting have been provided to the canteen and barracks Nos. 1 and 2.

2. Jamps have been provided to three sides of the building to protect it from damp during the rainy season.

3. Two walls of brick and lime masonry built up to roof in the harness room provided with two teakwood plank doors in place of mat frame doors and two galvanized windows.

4. Teakwood saddle rests for 200 mules have been provided, and 200 teakwood pegs have been let into the walls of the harness room.

Estimated amount	...	...	... Rs. 1,116 0 0
Actual expenditure	...	...	... „ 1,114 6 0

Provision of a latrine for the use of the Natives attached to the Mountain Battery.—A latrine on the Kárwár pattern containing 16 seats has been erected for the use of the natives attached to the Mountain Battery.

Estimated amount	...	...	... Rs. 532 0 0
Actual expenditure	...	...	... „ 531 8 3

NORTHERN DIVISION OF THE ARMY.

Stations.—Ahmedabad, Deesa, Mount Abu, Baroda, Ra'jkot, Bhuj and Surat.

AHMEDABAD.

Major Cruickshank, R.E., Executive Engineer, Ahmedabad Division, reports that the following sanitary works were undertaken during the year under report:—

Hospital for British Troops, Ahmedabad.—This work has been in progress since 1881.

Estimated cost	...	Rs. 1,80,909
Actual cost during 1882...	...	,, 36,977
Total cost	...	,, 36,923

Additions and alterations to well No. 21, Camp Ahmedabad.—The two receptacles at the south and west corners of the pavement have been removed and the holes filled in with earth. Cut-stone curbing has been fixed at the outer edges of the rectangular portions of the pavement to prevent the waste water from running off unchecked. An open paved drain has been laid from the south and west corners of the pavement to the open channel at the road side.

Estimated cost	...	Rs. 89
Actual cost	...	,, 76

Certain improvement to the store-rooms and well of the new Bakery.—The four openings in the walls of each of the rooms used as stores for bread, wheat and flour have been made and provided with wire netting in teakwood frames; also the mouth of the well has been covered with teak planking, 1" thick, clamped underneath, to prevent water being drawn from it until it is reported on favorably by the analyst.

Estimated cost	...	Rs. 44
Actual cost	...	,, 42

Latrine for the use of the families of the Medical Subordinates attached to the Native Infantry Hospital.—It consists of two compartments, each 3'×2'-3", with a door to each compartment with a portable corrugated sheet iron roof supported by teakwood posts, Walls are of split bamboo, earthen floor and foot rests solid blocks of stones. A small drain at back is provided to carry off ablution water, &c., to a receptacle at one end of the latrine.

Estimated cost	...	Rs. 107
Actual cost	...	,, 103

Small open drainage channels in rear of the three latrines used by the troops of H.M.'s 23rd Regiment N. I.

The existing arrangements for carrying off the ablution water at back of the latrines having been found faulty, small open drains have been constructed at the back of each latrine to carry off ablution water, &c., into the receptacles built at the ends of each latrine.

Estimated cost	...	Rs. 166
Actual cost	...	,, 135

Additions to the Bakery, Camp Ahmedabad.—Eleven clerestory openings, 3' × 1', have been pierced in the walls of the rooms in the main building; each opening is provided with a teak frame with a perforated zinc panel; shallow drains, 8" wide, are made in the asphalted floors of the sifting and kneading rooms. These channels run across the rooms sloping slightly towards the north-west wall, at which point they terminate, and in continuation cast-iron pipes, 3" diameter, are passed through the plinths of the wall under the verandah floor to the cut-stone channel which continues the drainage to the channel in the well pavement, and from thence to the channel which conveys the waste water outside the enclosure wall.

Estimated cost	...	Rs. 166
Actual cost	...	,, 138

Laying on water to the Bakery.—The water in the well of the new bakery enclosure having been pronounced by the Government Water Analyst as being bad, and the water in the larger of the two wells in the Commissariat cattle-yard as good in the last analysis taken on the 22nd June, 1882, it is arranged to convey water from an iron tank fixed at the well to the inside of the bakery compound by means of 2" diameter iron pipes with a brass stop cock at the extremity of the pipe at the bakery compound. This work is completed with the exception of fitting the cock.

Estimated cost	...	Rs. 490
Actual cost up to 31st December 1882 ...	...	,, 131

Removing and re-erecting urinary No. 40 so as to afford accommodation for canteen and stables of Royal Artillery.—The urinary No. 40, which was situated on the south-east of Royal Artillery stables, has been removed and re-erected near the Royal Artillery

canteen, where an urinary was necessary. It is now in a position convenient for the accommodation for both (canteen and stables).

Estimated cost	...	...	...	... Rs. 19
Actual cost	...	...	...	... „ 17

Stable for the Commissariat Serjeants.—A stable, in accordance with the sanctioned plan, has been constructed near and north-west of the out-houses in the compound of the Staff Serjeant's quarters No. 72 now occupied by a Commissariat subordinate officer. It is 11′×7′ inside measurement, 7 feet up to tie beam, single tiled roof, square teak principal supported on square teak posts and plates. Masonry dwarf wall built on three sides of the stable.

Estimated cost	...	...	...	... Rs. 255
Actual cost	...	...	...	... „ 240

DEESA.

The Officiating Executive Engineer, Military Works and Roads Division, states that the following sanitary works were undertaken during the year 1882 :—

Improving and repairing ventilators of Royal Artillery barracks.

Estimated cost	...	...	... Rs.	591 0 0
Actual cost	...	...	... „	590 11 6

Asphalting floors of the Native Infantry Hospital.

Estimated cost	...	...	... Rs.	2,029 0 0
Actual cost	...	...	... „	1,760 15 4

Removing floors of Royal Artillery stables and filling in with new earth to a depth of one foot and removing old earth outside of camp limits.

Estimated cost	...	...	... Rs.	939 0 0
Actual cost	...	...	... „	938 10 2

Constructing an additional urinary in Royal Artillery lines.

Estimated cost	...	...	... Rs.	85 0 0
Actual cost	...	...	... „	87 9 4

Improving surface drainage in the Royal Artillery and European Infantry lines.

Estimated cost	...	...	... Rs.	120 0 0
Actual cost	...	...	... „	113 1 2

Digging two holes covered with roof for observation of sub-soil.

Estimated cost	...	...	...	... Rs. 48
Actual cost	...	...	...	... „ 48

Making drains in the 3 privies in Native Cavalry lines.

Estimated cost	...	...	...	... Rs. 48
Actual cost	...	...	...	... „ 48

Providing culverts at the junction of the two roads near bázár guard-room and between Government garden and European Infantry Lines.

Estimated cost	...	...	... Rs.	590 0 0
Actual cost	...	...	... „	571 11 10

MOUNT ABU.

The Officiating Executive Engineer, Military Works and Roads Division, Abu, states that the following sanitary works were undertaken during the year 1882 :—

Constructing a new well for the Abu Sanitarium.

Estimated cost	...	...	... Rs.	500 0 0
Actual cost in 1882	...	...	... „	123 10 7
Total cost ...	...	...	... „	452 10 7

Adding a coat of asphalte to certain of the floors of the Military buildings.—The stone floors in the barracks are reported to be damp, and a coat of asphalte has been laid on to obviate this.

Estimated cost	...	...	... Rs.	9,591 0 0
Actual cost	...	...	... „	7,616 10 4

Renewing the verandah and dormitory floors of the Abu Lawrence School building by the substitution of stone pavement and asphalte.—Stone flags have been substituted for brick in verandahs. Asphalte with stone thoroughfares has been laid in dormitories.

Estimated amount	...	...	... Rs.	1,550 0 0
Actual outlay	...	...	... „	1,375 8 0

Constructing an urinary for the boys in Abu Lawrence School compound.

Estimated amount	...	...	... Rs. 98 0 0
Actual outlay	...	...	... „ 27 13 5

Latrine for patcherries. (In progress.)

Estimated cost	...	...	... Rs. 296
Actual outlay to 31st December 1882	...	...	„ 284

BARODA.

Major Cruickshank, R.E., Executive Engineer, Ahmedabad Division, states that during the year 1882 no large works of sanitary importance were carried on in the Cantonment of Baroda, but the following few small works were executed :—

Providing teakwood covering lids for 5 wells in the Native Infantry Lines.—These were provided to prevent leaves falling, or other rubbish being blown into the wells, so that the water may not be polluted.

Estimated cost	...	...	... Rs. 181
Actual cost	...	...	... „ 181

Supplying a Cooke's apparatus for heating water for the European Hospital.—It consists of Moulmein teak properly dowelled and jointed with hoops of 12 B. W. gauge 2″ wide, cylinder of copper ½″ in thickness, jointed and brazed. The grating is of iron bars fixed into a circular frame.

Estimated cost	...	...	... Rs. 51
Actual cost	...	...	... „ 50

Re-building the temporary wash-house No. 35.—This wash-house has been re-built with the exception of the floor which was allowed to remain, being of chunam plaster and in a good sound state. The walls are of round jungle teakwood covered with bamboo battens, the doors of cut teak framing, and the roof is of round junglewood and single-tiled.

Estimated cost	...	...	... Rs. 786 0 0
Actual cost...	...	...	... „ 687 4 5

Making necessary ventilation and improvements in the quarters occupied by the Hospital Assistant at the Station Hospital.—The rooms which are at present occupied by the hospital assistant had no ventilation or light other than that afforded by the doors when open; consequently each room has been provided with a glazed window with shutters on the inside, 3′ × 2½′; and open brick work ventilation has been made in the centre room.

A latrine is also being constructed with a removable roof; the internal dimensions are 3′ × 2½′; it is of split bamboo walls with doors. In progress.

Estimated cost	...	...	... Rs. 180
Expenditure up to 31st December 1882	...		... „ 83

New Bakery for European Troops.—This building, which was reported on in 1881, has been completed and handed over to the Commissariat Agent, Baroda, for use in November 1882.

Estimated cost...	...	...	... Rs. 17,277
Actual cost during 1882	...	...	... „ 2,747
Total expenditure	...	...	... „ 17,507

RAJKOT.

The Superintendent of Public Works, Rájkot, reports that the following sanitary works were carried out during the year :—

Constructed stone walls to the quarters of 2nd class hospital servants of Staff Hospital.

Estimated cost	...	...	... Rs. 635 0 0
Actual cost	...	...	... „ 632 7 0

Substituting cut black stone for earthen flooring in the quarter guard 2nd Prince of Wales' Own Grenadiers Native Infantry Regiment.

Estimated cost	...	...	... Rs. 298
Actual cost	...	...	... „ 298

Substituting cut black stone for earthen flooring in the verandah of the store guard, 2nd Prince of Wales' Own Grenadiers Native Infantry Regiment.

Estimated cost	...	...	... Rs. 194
Actual cost	...	...	... „ 194

Substituting cut black stone for earthen flooring in the jail guard-room.

Estimated cost	...	...	... Rs. 244
Actual cost	...	...	... „ 244

Substituting cut black stone for earthen flooring in the cavalry standard guard-room.

Estimated cost	...	...	... Rs. 225 0 0
Actual cost	...	...	... „ 224 13 0

For deepening a well in the dharmsháls, and for a bullock incline with requisite pipes and reservoir for cemetery at Rájkot.

Estimated cost	...	...	... Rs. 515 0 0
Actual cost	...	...	... „ 514 0 10

BHUJ.

Lieutenant Chapman, Superintendent, Public Works, states that no sanitary work was undertaken during the year 1882.

SURAT.

Mr. Lallubhai Kesavlal, Acting Executive Engineer, Surat, reports that no sanitary work was undertaken during the year 1882.

MHOW DIVISION OF THE ARMY.

Stations.—MHOW, INDORE, ASIRGARH, MEHIDPUR, NEEMUCH, NASIRABAD AND AUGAR.

MHOW.

Major Gibbs, Executive Engineer, Mhow Division, reports that the following minor works of sanitary improvement have been carried out during the year 1882 :—

Renewed roofing and paved floors of cook-houses and latrines attached to Staff Sergeant's quarters in cavalry line.

Estimated cost	...	...	... Rs. 861
Actual cost	...	...	... „ 763

Provided concrete flooring to 2 contagious disease wards of 2nd Native Infantry Hospital.

Estimated cost	...	...	... Rs. 1,434
Actual cost	...	...	... „ 1,207

Constructed two wards for contagious disease for camp followers and Staff Hospital.

Estimated cost	...	...	... Rs. 2,020
Actual cost	...	...	... „ 1,956

Provided 2" pipes and cocks to the wash-houses of cavalry barracks and quarter guard.

Estimated cost	...	...	... Rs. 2,434
Actual cost	...	...	... „ 2,170

Fixed piping in the wash-houses in the European Infantry lines.

Estimated cost	...	...	... Rs. 2,438
Actual cost	...	...	... „ 2,747

Provided pine ceiling to upper wards of amalgamated Hospital at Mhow and glazed clerestory windows.

Estimated cost	...	...	... Rs. 1,240
Actual cost	...	...	... „ 1,235

Stone pavement to floor spaces in rear of screen wall of latrines attached to barracks Nos. 1, 2 and 3, European Infantry lines.

Estimated cost	...	...	... Rs. 249
Actual cost	...	...	... „ 249

Constructed an open stone drain to back of new elephant shed, Royal Artillery.

Estimated cost	...	...	... Rs. 359
Actual cost	...	...	... „ 310

Paved floors of latrines of married men, &c., in the cavalry line.

Estimated cost	...	...	... Rs. 271
Actual cost	...	...	... „ 279

Made certain improvements to the floors and walls of the amalgamated Hospital.

Estimated cost	... Rs. 318
Actual cost	... „ 272

Dug up floor of stable No. 18, Royal Artillery, and re-filled with fresh earth.

Estimated cost	... Rs. 421
Actual cost	... „ 318

Paved drain in carrying away the water from cook-house, &c., in the buildings D/B, Royal Horse Artillery.

Estimated cost	... Rs. 92
Actual cost	... „ 101

Filled up 3 archways (in Female Hospital) with doors, &c., in amalgamated Hospital.

Estimated cost	... Rs. 150
Actual cost	... „ 150

Stone pavement to floors of latrines attached to Nos. 1 and 2 Royal Artillery Barracks.

Estimated cost	... Rs. 164
Actual cost	... „ 160

Provided wrought stone seats in latrines attached to Nos. 1 and 2 Royal Artillery Barracks.

Estimated cost	... Rs. 26
Actual cost	... „ 27

A latrine constructed with 3 seats for contagious diseases for Staff Hospital.

Estimated cost	... Rs. 119
Actual cost	... „ 89

Enlarged Government slaughtery sheep pen at south-west of the cattle pen, and enclosed with a wall 4½ feet high.

Estimated cost	... Rs. 131
Actual cost	... „ 118

Paved floors of latrines Nos. 37, 38 and 39 of family barracks, and provided masonry platform for seat boards.

Estimated cost	... Rs. 130
Actual cost	... „ 110

Renewed spring pressure tops in the lavatories and ablution rooms A/4 Royal Artillery.

Estimated cost	... Rs. 109
Actual cost	... „ 52

Paved floors of latrines of Nos. 3, 4 and 5 cavalry barracks.

Estimated cost	... Rs. 195
Actual cost	... „ 195

Built a verandah to Native guard-room and cells, Royal Artillery.

Estimated cost	... Rs. 97
Actual cost	... „ 92

Provided ventilators to bed-rooms in No. 5 block A/4, Royal Artillery.

Estimated cost	... Rs. 8
Actual cost	... „ 8

Provided ventilators to purveyor's room in Station Hospital, and removed a small gate in the south wall to the west wall opposite the centre of the apothecary's quarters.

Estimated cost	... Rs. 36
Actual cost	... „ 36

Constructed a cesspool to receive the elephant urine passing the drains in cattle lines 5/1, Royal Artillery.

Estimated cost	... Rs. 26
Actual cost	... „ 26

Trees planted in Royal Horse Artillery line.

Estimated cost	... Rs. 45
Actual cost	... „ 52

INDORE.

The Executive Engineer, Indore, states that no sanitary work was undertaken during the year 1882.

ASIRGARH.

The Executive Engineer, Hoshangabad Division, states that no special sanitary works were undertaken at Asirgarh during the past year.

MEHIDPUR.

No new work was executed during the year 1882.

NEEMUCH.

The Executive Engineer, Neemuch Division, reports that the following sanitary works were carried out during the year 1882 :—

Improving the drainage of the Sadar Bázár. In progress.

Estimated cost	... Rs.	15,000	0 0
Expenditure in 1882 ...	... „	369	7 7
Total cost	... „	10,429	13 2

Repairs to culverts, drains and road metalling in Sadar Bázár.

Estimated cost	... Rs.	267	0 0
Expenditure in 1882	... „	195	10 1
Actual outlay	... „	233	13 3

NASIRABAD.

The Executive Engineer, Military Works and Roads Division, Nasirabad, states that the following sanitary works were undertaken during the year 1882 :—

Nasirabad water-supply from the Danta Reservoir.—This scheme has been in hand since October 1875. It is not yet completed. Water is, however, supplied to the European Infantry, Royal Artillery, Native Infantry and Native Cavalry lines and public gardens.

Estimated cost	... Rs.	2,76,671
Actual expenditure in 1882 ...	... „	3,119

Building an urinal for native grass cutters and followers attached to the Royal Artillery at Nasirabad.

Estimated cost	... Rs.	126	0 0
Actual cost	... „	122	3 11

Putting down gravel in the yard of European Infantry cook-houses.

Estimated cost	... Rs.	35
Actual cost	... „	35

Digging holes in the vicinity of the European Infantry barracks to ascertain the condition of the sub-soil during and after the rains.

Estimated cost	... Rs.	12
Actual cost	... „	8

Fixing apparatus for filling water carts from General Phayre's well.

Estimated cost	... Rs.	30	0 0
Actual cost	... „	32	3 2

AUGAR.

No new work was executed during the year 1882.

BELGAUM DISTRICT.

Stations.—Belgaum, Dha'rwa'r.

BELGAUM.

Major Seton, R. E., Executive Engineer, Belgaum, reports that the following sanitary works were carried out during the year 1882.

Constructing open drains and cesspools in the European Infantry Barracks.—Three open drains with stone and lime and a masonry cesspool at the extremity of each drain with stone and lime constructed.

Sanctioned amount	... Rs.	165
Actual cost	... „	163

Improving the regimental latrines of the 20th Native Infantry.—New paved segmental drains in rear of the latrines of the 20th Native Infantry Regiment constructed; two old ones re-constructed to allow the ablution water to run off properly. The paving of the privy seats renewed. Four masonry sinks with teakwood shutters and frames and four iron receptacles provided. The moorum floor of passage renewed.

Sanctioned amount	...	...	... Rs. 448
Actual cost	...	...	... „ 448

DHÁRWÁR.

Lieutenant-Colonel Mander, R. E., Executive Engineer, Dhárwár, states that no new work of any sort has been carried out in the new Native Infantry lines at Dhárwár during the year 1882.

BOMBAY DISTRICT.

Stations.—Cola'ba, Bombay and Devla'li.

COLÁBA.

Lieutenant-Colonel Merriman, R.E., Executive Engineer, Bombay Defences, reports that the following sanitary works were undertaken during the year 1882 :—

Providing a ridge ventilator to the regimental Serjeants' quarters, No. 16, at Upper Colába.—A double-tiled ridge ventilator, similar to those on the regimental cook-rooms, have been provided. It is 45′ × 5′ in clear.

Estimated cost	...	...	... Rs. 126
Actual outlay	...	...	... „ 120

Making certain additions to the house No. 10 close to the Station Hospital.—House No. 10 is converted into the prisoner's ward by providing iron bars to the 4 inner windows and iron cross bolts to the 3 inner doors.

Estimated cost	...	...	... Rs. 37
Actual outlay	...	...	... „ 37

Making certain improvements to the two sets or trains of punkahs in the north dormitory of No. 1, Royal Artillery Barracks.—Two sets or trains of punkahs in the north dormitory of the Royal Artillery Barrack No. 1 have been rigidly connected by means of bamboos; one of the trains having been suspended with ropes and the other with iron rods, at an actual expenditure of Rs. 19-2-1 and Rs. 12-5-0 respectively.

Estimated cost	...	...	... Rs. 32
Actual outlay	...	...	... „ 31

Construction of certain drains to the Royal Artillery Barracks.—Surface drains of dry rubble work to take the waste water from the wash-houses of the Royal Artillery barracks into the sea.

Estimated cost	...	...	... Rs. 817
Actual outlay	...	...	... „ 545

Fitting iron gratings over the ventilator of the cells of the Royal Artillery Guard-room.—Windows have been fitted with iron gratings.

Estimated cost	...	...	... Rs. 36
Actual outlay	...	...	... „ 32

Making certain additions and alterations to the Serjeants' Mess of the Depôt Barracks.—The brick nogging partition between the Serjeants' Mess and the store-room adjoining it has been pulled down and removed. Three windows have been fitted with venetianed shutters.

Estimated cost	...	...	... Rs. 48
Actual outlay	...	...	... „ 48

Erecting a small urinary to the back of the Serjeants' Mess of the Depôt Barracks.—A small urinary, 6′ × 6′ × 7′ in height, similar to those in the Infantry lines, has been erected.

Estimated cost	...	...	... Rs. 45
Actual outlay	...	...	... 36

Providing glazed shutter to bangalow No. 13 at Colába occupied by Surgeon Major Codrington.—Fourteen glazed shutters, each 3′×4′, have been provided in addition to the existing venetianed windows in the sitting room.

Estimated cost	...	...	...	... Rs. 122
Actual outlay	...	...	...	... „ 122

Making certain additions and alterations to the bangalow at present used as the Half Battalion Mess-house.—Two cadjan covered passages have been erected, *viz.*, one, 106 feet long, from the mess to the billiard-room, and the other, 36 feet long, from the kitchen to the mess. The covered passages are 5 feet in width, and are exactly similar to those leading from the Infantry barracks to their outbuildings.

Estimated cost	...	...	...	... Rs. 296
Actual outlay	...	...	...	... „ 295

Raising a portion of the compound wall of the Commandant's House, Colába Depôt.—To obstruct the view of the single men's latrines from the verandah of the Commandant's house, a portion of compound wall, measuring 32 running feet, on the north side has been raised from 7′×9½′.

Estimated cost	...	...	...	... Rs. 23
Actual outlay	...	...	...	... „ 22

Planting trees at Colába Cantonment.—150 trees have been planted.

Estimated cost	...	...	...	... Rs. 1,575
Actual outlay	...	...	...	... „ 1,565

Planting trees at Colába.—100 additional trees have been planted, *viz.*, 36 along the main road from the Depôt Barracks to St. John's Church, 15 along the cross road to the Lunatic Asylum by the Government Observatory, and 49 along the branch road leading to the Station Hospital.

Estimated cost	...	...	...	... Rs. 1,155
Actual outlay	...	...	...	... „ 702

Improvements to the water-supply of Native Infantry Lines at Bori Bandar.—Some extra items were executed, such as paving and drains in front of the iron tanks in connection with the water-supply.

Estimated cost	...	...	...	... Rs. 1,080
Actual outlay	...	...	...	... „ 925

BOMBAY.

Mr. M. C. Murzban, C.E., Acting Executive Engineer, Presidency, reports that the following sanitary works were carried out during the year 1882 :—

Laying a cast-iron drain pipe to the Staff Serjeants' Quarters, Town Barracks.—There having been no properly constructed drain to carry the waste water from the bath-rooms of the quarters, a 4″ cast-iron pipe drain, with a masonry disconnecting chamber, siphon-traps, ventilator, pipe, &c., has been laid and connected with the municipal street drain.

Estimated cost	...	...	...	... Rs. 675
Actual cost	...	...	...	... „ 618

Additions and alterations to the latrines used by the Commissariat followers in the compound of the Town Barracks.—A separate latrine, having two seats, has been added for the use of clerks of the Commissariat Department to the existing latrines which are used by the camp followers of that department, and a small bath-room built for the use of the women of the camp followers who hitherto used an adjoining gully for that purpose.

Estimated cost	...	...	...	... Rs. 592
Actual cost	...	...	...	... „ 554

Improvements to the bath-room of the old Sailors' Home, Bombay.—A wooden tank on a stand has been put up in the bath-room on the first floor with a ball cock to prevent waste of water.

Estimated cost	...	...	...	... Rs. 59
Actual outlay	...	...	...	... „ 52

DEVLA'LI.

Major Colson, R.E., Executive Engineer, Násik Division, reports that the following sanitary works were carried out during the year 1882 :—

Paving the floors of certain Commissariat buildings at Camp Devlálí.—In order to prevent injury from white ants the floors of the store-room at west end and the rooms used for an office in the east end of No. 2 godown, as also that of the grinding room in use as kneading room, have been paved with stone on 6″ concrete.

Estimated cost	...	...	...	... Rs. 689
Actual cost	...	...	...	... „ 689

Constructing a dry stone parapet wall along the side of the road in front of No. 5 Abyssinian Hut.—To prevent persons falling into deep ditches adjacent to the railway station during dark nights a dry stone parapet wall, with rough semicircular coping set in chunam, has been built along the piece of the road in front of No. 5 Abyssinian hut.

Estimated cost	...	...	...	... Rs. 312
Actual cost	...	...	...	... „ 312

Alterations to the ovens of the Government Bakery.—There having been many complaints of the faulty construction of the bakery ovens at Deválí Cantonment, these have been taken down and rebuilt in exact accordance with the standard plan of the Government of India.

Estimated cost	...	...	...	... Rs. 787
Actual cost	...	...	...	... „ 783

Alteration to the Lightning Conductor attached to Magazine at Camp Deválí.—The Telegraph Master, Deválí, when last testing the conductor discovered that the electric current did not pass beyond the copper bands, the chain portion being defective. The chain was accordingly taken away and replaced by a copper band 1¼" wide and ¼' thick terminating in a copper plate 3' square at the bottom of a well.

Estimated cost	...	...	...	... Rs. 261
Actual cost	...	...	...	... „ 261

Supplying Cooke's water-heating apparatus to the male and female hospitals.—Two apparatus have been purchased at a cost of Rs. 115, and supplied to the station.

SIND DISTRICT.

Stations.—KARA'CHI, HYDERABAD AND JACOBABAD.

Major Clive, R.E., Executive Engineer, Lower and Central Sind, reports that the following sanitary works were executed at Karáchi, Hyderabad and Jacobabad during the past year :—

KARA'CHI.

Constructing night urinals, Royal Artillery lines.

Estimated cost	...	...	...	Rs. 146 0 0
Actual cost	...	...	...	„ 139 8 0

Excavating and removing old earth floors, Nos. 52 and 53 barracks, Native Infantry lines, and re-filling with fresh earth.

Estimated cost	...	...	...	... Rs. 200
Actual cost	...	...	...	... „ 196

Raising roofs of the two covered sentry-walks, Ordnance Magazine Guard, and removing privy further off and to leeward.

Estimated cost	...	...	...	... Rs. 496
Actual cost	...	...	...	... „ 480

Additions and improvements to native latrines, Royal Artillery lines.

Estimated cost	...	...	...	... Rs. 200
Actual cost	...	...	...	... „ 196

HYDERABAD.

Improving ventilators to pendalls, Native Infantry lines.

Estimated cost	...	...	...	... Rs. 328
Actual cost	...	...	...	... „ 328

Providing urinal to guard-house, Native Infantry lines.

Estimated cost	...	...	...	... Rs. 171
Actual cost	...	...	...	... „ 171

Additions and improvements to lavatories of Station Hospital.

Estimated cost	...	...	...	... Rs. 776
Actual cost	...	...	...	... „ 776

JACOBABAD.

Cleaning main tank.

Estimated cost	... Rs. 300
Actual cost	... „ 292

Cleaning trench round cavalry lines.

Estimated cost	... Rs. 153
Actual cost	... „ 143

ADEN BRIGADE.

ADEN.

Major Twemlow, R.E., Executive Engineer, Aden, reports that the following sanitary works were undertaken during the year 1882 :—

Erecting temporary cook-houses and latrines for European Troops at Steamer Point.—Side walls and roofs of date matting. Roofs covered with double layers of jowlis.

Estimated cost	... Rs. 662
Actual outlay	... „ 553

Improving latrines for followers of the Commissariat Department, Crater.—A gutter set in cement has been provided to carry off any urine that may lodge on the paving. It is 6″ × 4″, and has a slope of 6″ in its length. A cesspit 2′ × 2′ × 2′ and an iron receptacle 1½′ × 10″ have been provided.

Estimated cost	... Rs. 85
Actual outlay	... „ 79

Providing 4 huts for infectious disease cases at Steamer Point.—Each ward consists of one room 20′ × 10′ × 10′, an open verandah 5′ wide all round with partitioned bath-room 7′ broad at one end. Floor asphalted; 4 servants' quarters, each 10′ square, with verandah 6′ wide in front. Ventilation provided for.

Estimated cost	... Rs. 3,796
Actual outlay	... „ 3,796

Providing masonry gutter and cesspool with iron receptacle to No. 17 latrine, Battery Lascars' Lines, Steamer Point.—In rear of latrine a masonry foundation 2′ × 1½′ has been filled in, and a cesspool 2′ diameter has been built. Inner sides of cesspool and connecting gutter finished off with cement plaster. An iron receptacle has been provided.

Estimated cost	... Rs. 24
Actual outlay	... „ 24

Improving the Sanitarium Hospital at Steamer Point.—Renewals have been made of posts, plates, rafters, cloth of inner walls and mat and trellis of outer walls.

Estimated cost	... Rs. 2,054
Actual outlay	... „ 2,052

Re-constructing lower male ward, European Infantry Hospital, Crater.—Renewals have been made of posts, plates, rafters, cloth of inner walls, and mat and trellis of outer walls.

Estimated cost	... Rs. 4,012
Actual outlay	... „ 4,020

Reconstructing [illegible] ward of European Infantry Hospital, Crater.—Renewals have been made of posts, plates, rafters, cloth of inner walls, and mat and trellis of outer walls. Whole of roof covering has been renewed.

Estimated cost	... Rs. 3,741
Actual outlay	... „ 3,730

Making a pathway at Camp Bay.—A pathway has been made from the new lines, Sappers and Miners, towards the sea by clearing loose sand and spreading 3″ to 4″ rough metal and 3″ moorum. Length 992′, breadth 5′.

Estimated cost	... Rs. 200
Actual outlay	... „ 199

Putting temporary latrines and cook-houses for European Troops at Steamer Point into serviceable condition.—The bamboo and mat walls have been repaired, and new posts and plates have been fixed where necessary, and the site cleared of all drifted sand and rubbish.

Estimated cost	... Rs. 128
Actual outlay	... „ 131

Constructing a temporary latrine for European Troops at Steamer Point.—The latrine is 33' × 5' × 7', and is divided into 8 separate compartments, each 4' × 5'. It consists of walls and roofs of Aden reeds, mats, jowlis, and Zanzibar and Aden rafters, and is built on the platform close to and in rear of No. 3 barrack.

Estimated cost	...	...	...	... Rs. 128
Actual outlay	...	...	...	... „ 128

Erecting sweepers' huts at Isthmus.—A hut, 10' × 12', with pent-house roof has been constructed of Aden reeds, mats, jowlis, and Zanzibar rafters, to accommodate two sweepers.

Estimated cost	...	...	...	... Rs. 40
Actual outlay	...	...	...	... „ 40

SECTION V.

SANITARY WORKS—CIVIL.

1. The original reports received from municipalities have been abstracted, and the results are here given.

2. The total annual income of the various municipalities is Rs. 29,19,425 and the sum expended on conservancy by them during the year 1881-82 is Rs. 7,22,280.

3 The details of the sanitary condition of the municipal towns are given below by divisions :—

NORTHERN DIVISION.

District.	Name of Municipality.	Population.			Annual Income.	Expenditure on Conservancy.
		Males.	Females.	Total.		
					Rs.	Rs.
Ahmedabad.	1. Ahmedabad City	61,679	63,088	124,767	2,84,602	56,216
	2. Dholka Town	8,548	9,168	17,716	9,949	2,851
	3. Dhandhuka Town ...	4,934	5,110	10,044	6,556	1,022
	4. Viramgám do. ...	9,547	9,443	18,990	16,101	9,648
	5. Parántij do. ...	3,977	4,376	8,353	2,742	425
	6. Modása do. ...	3,369	3,662	7,031	3,383	2,432
	7. Gogha do. ...	3,183	3,880	7,063	2,341	540
	Total ...	95,237	98,727	193,964	3,25,674	73,134
Kaira.	8. Kaira Town	6,432	6,208	12,640	9,137	2,099
	9. Mehmadabad Town ...	4,153	4,020	8,173	2,347	406
	10. Nadiád do. ...	14,773	13,531	28,304	21,704	4,583
	11. Kapadvanj do. ...	6,857	7,585	14,442	8,897	979
	12. Dákor do. ...	4,239	3,532	7,771	17,198	1,788
	Total ...	36,454	34,876	71,330	59,283	9,846
Panch Mahála.	13. Godhra Town	6,804	6,538	13,342	4,921	814
	14. Dohád do.	6,254	6,140	12,394	5,813	1,085
	Total ...	13,058	12,678	25,736	10,734	1,899
Broach.	15. Broach City	19,404	17,877	37,281	74,362	10,252
	16. Anklesvar Town ...	4,983	4,552	9,535	12,721	1,316
	17. Jambusar do.	5,925	5,554	11,479	6,667	2,174
	Total ...	30,312	27,983	58,295	93,750	13,742
Surat.	18. Surat City	54,524	52,630	107,154	2,55,211	74,730
	19. Rander Town	4,260	5,156	9,416	16,582	3,241
	20. Bulsar do.	6,868	6,361	13,229	16,224	2,446
	21. Mándvi do.	2,445	2,299	4,744	4,586	523
	Total ...	68,097	66,446	134,543	2,92,603	80,940

District.	Name of Municipality.	Population.			Annual Income.	Expenditure on Conservancy.
		Males.	Females.	Total.		
					Rs.	Rs.
Thána.	22. Thána Town	7,856	6,600	14,456	19,600	5,993
	23. Kalyán do.	6,976	5,934	12,910	14,068	4,152
	24. Bhíwndi do.	7,155	6,682	13,837	14,880	3,267
	25. Panvel do.	5,462	4,889	10,351	5,443	1,584
	26. Máhim do.	3,543	3,579	7,122	3,382	586
	27. Bassein do.	5,278	5,079	10,357	7,305	1,120
	28. Bándra do.	7,802	7,185	14,987	18,032	2,624
	29. Kúrla do.	5,607	4,108	9,715	4,538	1,588
	30. Uran do.	5,754	4,395	10,149	6,777	1,552
	Total ...	55,433	48,451	103,884	94,025	22,466
Kolába.	31. Alibág	3,368	3,008	6,376	10,766	5,150
	32. Pen	4,258	3,824	8,082	7,558	3,820
	33. Roha Ashtami	2,460	2,434	4,894	2,242	422
	34. Mahád	3,592	3,212	6,804	3,181	2,486
	Total ...	13,678	12,478	26,156	23,747	11,878
	Grand Total ...	312,269	301,639	613,908	8,99,816	2,13,905

Water-supply.—The existing arrangements in the above municipal towns are the same as those of last year. At Ahmedabad city the greater portion of the distribution mains consist of clay pipes; and with the object of reducing the pressure in the main, air shafts have been erected at intervals of 700 or 800 yards. Three new wells have been sunk at Viramgám. At Paránt́j the supply is from 20 public wells. At Gogha one of the chief sources of water-supply is from an open brick-built reservoir about 366 feet in length and 150 feet in breadth within the walls of the town; this is filled by a closed water channel, partly cut in the earth and partly built of masonry, which leads to it from a large tank situated in the north, north-west side of the town. The water passes through a filter of gravel and babul thorns before entering the reservoir; the quality of the water is good. The 24 public wells at Nadiád are cleaned periodically by the municipality during the hot season. At Dohad a new well was sunk. Thána town is now supplied with pure wholesome water from Pokhran reservoir: *vide* Sanitary Commissioner's Report for 1881, Section VI, page 1, para. 2. At Máhim the tank called Ranjni, the water of which is considered very good, was deepened at a cost of Rs. 2,000. At Uran water is brought to the "Bhimátia" tank by a channel from a hill and is reserved for drinking purposes only. The municipality of Roha Ashtami to improve the water-supply have taken a loan of Rs. 5,000 from Government, and with the aid of local funds and municipal contributions are constructing water-works at a cost of Rs. 19,869.

Drainage.—Most of these municipal towns have open masonry side drains to the main roads and mere cuttings to other roads. The following towns have no drains:—Dholka, Dhandhuka, Gogha, Anklesvar, Jambusar, Mehmadabád, and Mahád. At Kaira in the main streets there are 5 closed drains of masonry, and these are cleaned periodically by the municipality and kept under thorough repair. A scheme for the better drainage of the town is under consideration. Some of the drains at Thána and Kalyán are covered.

Cesspools.—There are no municipal cesspools, but almost all private houses have them, and the owners are held responsible for their cleanliness. Viramgám has 2 public cesspools, and they are kept clean by the municipality. At Thána there are 61 cesspools of various sizes of brick and lime masonry, and 98 common pits; they are cleaned out periodically by municipal servants.

Scavengering.—Sweepers are employed by each municipality to keep the towns and streets clean. At Gogha and Anklesvar it is done by contract. Street sweepings are generally sold. At Ahmedabad, poudrette is manufactured and sold for Rs. 1,232, and Rs. 129 have been realized from the sale of dry bones. At Viramgám, Parántij, Mándvi and Kúrla the sweepings are utilized in filling up hollows. Poudrette was prepared at Broach. At Bulsár town the street sweepings are used in reclaiming low-lying ground. At Surat poudrette is manufactured and sold for Rs. 1,005, and Rs. 1,809 were realized from sale of street sweepings. At Thána the sweepings are thrown on the ground, which is being reclaimed and covered with earth. The manufacture of poudrette has been given up at Alíbág. At Roha Ashtami the sweepings are burnt.

Latrines.—There are several public latrines at most of the municipal towns in this division, and they are looked after by municipal sweepers. Modása has only one, and it is reserved for women. The following towns have no latrines:—Godhra, Jambusar, Anklesvar, Kúrla, Bassein, Máhím, Panvel and Roha Ashtami. At Ahmedabad there were about 40 deep well private privies; of these 11 were converted into surface privies; the remaining 29 have been allowed to remain under orders from the High Court. At this town public as well as private privies are cleaned by municipal sweepers. Some of the private privies at Viramgám are cleaned by municipal sweepers, the expense being borne by the owners. At Parántij there are no public latrines, but there is a fenced off space reserved for the use of females. At Nadiád private privies are also cleaned by the municipal sweepers, but at the cost of the owners. At Dákor fields are set apart for natural purposes, and are cleaned daily by municipal sweepers. Trench system of latrine exists at Dohad. There are no public latrines at Broach, but provision has been made for latrines of 665 seats. At Bulsár, Kúrla, Bassein, Kalyán, Thána, and Alíbág private privies are cleaned by municipal sweepers. Máhád has public latrines; but they are not used, as there are no sweepers employed to clean them.

Urinals.—The municipal towns in the Ahmedabad and Kaira districts, Surat city and Anklesvar town have urinals, and they are daily washed out and kept clean. The cleaning of latrines and urinals at Gogha is done by contract.

Markets.—The following towns have markets:—Ahmedabad city, Dhandhuka, Dholka, Kapadvanj, all the municipal towns in Surat District and also those of Thána District, with the exception Máhím and Bhiwndi. Alíbág has one. They are washed out daily and kept clean.

Burial Grounds and Cremation Ghâts.—Each municipal town has several of these, and they are outside the town. Cremation ghâts are generally on the banks of rivers.

New Works.—At Ahmedabad, Rs. 3,860 on godowns, Rs. 1,156 on a new well, Rs. 367 on public urinaries, Rs. 1,888 on side gutters to roads, Rs. 4,886 on covered drains, Rs. 385 on a road, Rs. 2,663 on Naginavádi garden, on roads to a tank Rs. 1,981, for levelling ground behind the retaining wall Rs. 64, for raising a portion of the steps of a tank Rs. 461, and Rs. 15,961 on a grain market. Rs. 17,096 were spent on repairs to gutters, drains, roads, city wells, filling up hollows, &c., &c. Dhandhuka.—A masonry embankment Rs. 289, a privy Rs. 52, a shed Rs. 15, and on fencing to a well Rs. 10. Viramgám.—A pucka road with gutters on each side. Modása.—A metalled road. Kaira.—A wooden bridge rebuilt, Rs. 473. Mehmadabad.—Side drains to roads, a culvert near the Virol Gate, and 11 urinals. Nadiád.—An additional room for Hospital Assistant, police chauki, a masonry cistern, a slaughter-house, and 6 latrines. Kapadvanj.—9 urinals, a culvert to a road, an additional storey to a library building. Godhra.—Road metalling by Public Works Department. At Dohad Rs. 936 were spent on roads. Broach.—Paving slopes Rs. 1,168, metalling roads Rs. 1,317, extension of Sodhevar weir on the Empress road Rs. 821, railings on Sooneri Mahál road Rs. 1,497. Anklesvar.—4 urinals. Surat.—A well Rs. 178, police chauki Rs. 2,074, latrines Rs. 245, wooden railing to Hope bridge, Rs. 2,154, improving bye-lanes Rs. 9,998, 2 roads Rs. 1,832, cattle-pound Rs. 218, and 40 lamp posts Rs. 120. Ránder.—A new latrine, Rs. 1,036. Mándvi.—A latrine Rs. 298, toll chauki Rs. 46, extension of Vazirovara on the river side

Rs. 143. Thána.—2 markets and a small road. Kúrla.—A market. Bándra.—Additions to market, 200 feet masonry drains, 300 feet road, and 4 latrines. Máhím.—Street repairing. Bhiwndi.—2 latrines and 8 dust bins.

Central Division.

District.	Name of Municipality.	Population			Annual Income.	Expenditure on Conservancy.
		Males.	Females.	Total.		
					Rs.	Rs.
Ahmednagar.	1. Ahmednagar	16,733	16,170	32,903	51,687	13,794
	2. Bhingár	2,562	2,544	5,106	3,113	1,482
	3. Sangamner	4,445	4,351	8,796	6,678	2,570
	4. Puntámba	...	...	...	396	120
		23,740	23,065	46,805	61,874	17,966
Khándesh.	5. Jalgaon	5,254	4,664	9,918	18,582	5,319
	6. Varangaon	2,062	2,149	4,211	1,127	295
	7. Erandol	5,676	5,825	11,501	5,867	1,577
	8. Párola	6,114	6,240	12,354	4,029	3,617
	9. Dharamgaon	6,707	6,374	13,081	4,381	1,816
	10. Amalner	3,811	3,816	7,627	2,541	1,181
	11. Bhadgaon	3,262	3,275	6,537	2,297	1,010
	12. Máheji	1,500	500	2,000	1,491	334
	13. Sángvi	2,152	2,089	4,241	3,156	396
	14. Prakásha	2,858	2,793	5,651	1,606	833
	15. Nandurbár	3,213	3,628	6,841	4,488	1,499
	16. Taloda	2,914	2,749	5,663	4,018	798
	17. Dhulia	9,659	8,790	18,449	35,019	5,997
	18. Sindkheda	2,277	2,224	4,501	1,924	349
	19. Betávad	2,614	2,668	5,282	1,114	236
	20. Shirpur	4,002	3,611	7,613	3,696	1,442
	21. Chopda	6,933	6,999	13,932	3,701	1,531
	22. Sháhada	2,697	2,814	5,441	2,922	2,597
		73,635	71,208	144,843	1,01,959	30,827
Násik.	23. Násik	12,198	11,903	24,101	45,043	22,564
	24. Trimbak	1,883	1,956	3,839	2,380	898
	25. Sinnar	3,958	4,002	7,960	1,819	326
	26. Igatpuri	3,546	2,760	6,306	2,998	1,328
	27. Málegaon	5,308	5,314	10,622	10,000	3,419
	28. Yeola	8,975	8,710	17,685	24,048	6,234
		35,868	34,645	70,513	86,288	34,769
Poona.	29. Poona City	50,814	48,808	99,622	2,31,817	62,919
	30. Indápur	2,131	2,111	4,242	1,857	349
	31. Bárámati	2,700	2,572	5,272	6,000	1,024
	32. Sásvad	2,709	2,975	5,684	2,629	554
	33. Jejuri	1,652	1,593	3,245	3,471	449
	34. Ghodnadi or Sirúr	2,041	2,351	4,392	8,622	1,550
	35 Talegaon Dhamdhera ...	1,729	1,891	3,620	1,572	133
	36. Junnar	5,043	5,330	10,373	2,761	684
	37. Talegaon Dábháda	2,420	2,480	4,900	2,265	472
	38. Khed	3,539	3,476	7,015	2,999	256
	39. A'landi	876	878	1,754	4,597	936
	40. Lonávla	1,774	1,560	3,334	1,902	206
	Total ...	77,428	76,025	153,453	2,69,692	69,531

District.	Name of Municipality.	Population.			Annual Income.	Expenditure on Conservancy.
		Male.	Female.	Total.		
					Rs.	Rs.
Sátára.	41. Karád*	5,459	5,319	10,778	...	...
	42. Vita	2,233	2,244	4,477	824	72
	43. Sátára	14,558	14,043	28,601	146,120	2,498
	44. Rahimatpur	3,042	3,040	6,082	1,430	474
	45. Wái	5,728	5,948	11,676	7,628	2,152
	46. Malcolmpeth	1,835	1,409	3,244	15,096	602
	47. Islámpur*	4,392	4,557	8,949	...	...
	48. Tásgaon	5,179	5,027	10,206	2,849	433
	49. Ashta*	4,838	4,710	9,548	...	...
	50. Pussesávli	1,412	1,157	2,569	1,110	170
	51. Máyni	1,432	1,563	2,997	438	52
	52. Mhaswad	2,732	2,829	5,561	1,887	150
	53. Shignápur	660	507	1,167	3,836	131
	Total ...	53,522	52,353	105,875	1,81,218	6,734
Sholápur.	Sholápur City	30,410	29,480	59,890	1,27,800	25,659
	Bársi	8,206	7,920	16,126	53,255	3,358
	Karmála	2,495	2,576	5,071	4,888	687
	Pandharpur	8,134	8,776	16,910	73,090	47,188
	Sángola	2,315	2,411	4,726	1,136	567
	Total ...	51,560	51,163	102,723	2,60,769	77,459
	Grand Total ...	315,753	3,08,459	624,212	9,61,800	2,37,286

* Reports not received.

Water-supply.—The existing arrangements in the above municipal towns are the same as those of last year. The water in the aqueducts at Ahmednagar city had run short during the year under report; this was due to the scanty fall of rain, not only during the year, but in the previous one also, and the municipality underwent an expense of Rs. 349 to feed the aqueducts with water obtained from an adjacent well, and poured into their lines for nearly the whole year. The municipality had also a lot of springs (giras) dug in the bed of the river Suca. Bhingár has a perennial supply of excellent water which flows through an aqueduct from springs in the ghâts: there are 8 tanks, of these 4 are for drinking purposes and 5 public wells. At Puntámba the water of the river Godávari is made use of. The towns in the Khándesh District chiefly derive their supply from wells, tanks and rivers. At Násik the river Godávari is the chief source of water-supply, but the inhabitants in the southern part of the town use well water and also get their supply from a fountain, called Howd, which is supplied from the river Nasardi by a subterranean aqueduct from a point about 2 miles west of the town, but during the hot season the supply from these rivers fails. Trimbak from 20 wells and 10 tanks; of the latter only 2 are used for drinking purpose. Sinnar from the rivers Shio and Dio and from 12 wells; the latter are cleaned out annually at the commencement of the hot weather. Igatpuri mainly depends for its supply on 6 stand-pipes consisting of 17 cocks; the water is allowed gratis in the stand-pipes by the G. I. P. Railway Company from their tank: there are, besides, 9 wells. Málegaon from the river Mosum and 8 wells. The year under report has been an exceptional year of draught for Yeola town, and scarcity of water was greatly felt: the municipality had to make special arrangements for supplying townspeople with pure water at an enormous cost. Sirúr from the river Ghodnadi. At Lonávla the G. I. P. Railway Company allow the use of the water from Bhustir tank, which is turned on to hydrants at certain hours. Khed from the river Bhíma. Talegaon Dábháda from a large tank to the south of the town. Junnar from 2 large wells; from these the water is carried to 14 cisterns in the town by means of earthen pipes from a tank and from the river

Kukdi. The municipality has constructed a storage receptacle in which water collects, and is thence carried to several cisterns. Alandi from the river Indráyáni. Talegaon Dhamdhera from the river Vela. Bárámati from the river Kusa, and, when the water fails, pits are dug in the bed of the river. The municipal towns in the Sátára District derive their supply chiefly from running streams, and, when they dry up, temporary wells are dug in the beds of rivers. Sholápur town is now supplied with pure drinking water from the Ekruk tank about 4 miles to the north of the city (*vide* Sanitary Commissioner's Annual Report for 1881, Section VI, para. 40, page 11). The towns in the Sholápur District are dependent for their supply on wells and tanks.

Drainage.—In all the municipal towns in this division there are open masonry drains in the principal streets, and in side streets mere cuttings to drain away the rain water. A main drain for Ahmednagar city is under consideration. At Sangamner 2 additional drains were constructed to meet the main drain leading southward to the river. The main drain at Násik is connected with all the houses in the quarter it traverses. There are two or three subsidiary drains in connection with it: from Nao Gate the drainage is carried away through iron pipes over and across the stream, and discharged into an open trench, which is at a considerable distance below the town. In the Kázipura section of the town a large masonry drain has been constructed, the sewage flowing into the Nagziráv nála, from whence it enters the river down stream. A new drain, 50 feet long, was constructed and connected with the drain below the Trimbak Gate; 6 drains were cleaned during the year. At Málegaon the municipality are constructing substantial side drains to all the streets of that town. In Poona the sullage of the western two-thirds of the city is carried by underground sewers, which is discharged in the Mutha River; the sullage of the eastern one-third of the city, where no sewers exist, is collected in cesspools and removed by bhistis, who throw it into fields, where it is immediately covered over with earth or ashes. The principal streets have dry-stone covered side drain. At Talegaon Dábháda there is a subterranean drain in Rawrivav Peth street; there are also closed side drains in this street. At Junnar in some portion of the town there are built gutters, and the gutters in the sadar bázár are covered. At Sholápur, besides open side drains, there are 4 underground sewers; 3 of these are of faulty construction, having little or no slope, and the municipality incur heavy expense in removing the silt that gathers in them; they run from south to north. The fourth has a greater slope, and serves its purpose well; it runs from east to west.

Cesspools.—There are no municipal ones, but private houses at Ahmednagar, Sangamner, Igatpuri, Amalner, Párola and other towns have them, and some of them are never cleaned. At Sindkheda there are 8 and at Shirpur 75, and these are cleaned by the municipality. At Málegaon 14 pits have been constructed in the drains for collection of foul water, which is removed in carts. At Násik the sewage at the terminus of the drains falls in a cesspool from which the sewage is carried away through iron pipes over and across the stream to prevent it from mixing with the river water. In the eastern part of Poona city there are cesspools, as no sewers exist, but they are cleaned daily by municipal servants. The foul water in the cesspools in the Sholápur town is removed in cylindrical carts by the municipality.

Scavengering.—Establishments are kept by every municipality in this division for keeping the towns and streets clean. Street sweepings are generally sold. At Ahmednagar part of the sweepings sold for Rs. 795, and the remainder was burnt, and poudrette prepared, from the sale of which Rs. 282 were realized. At Sangamner the right of removing refuse was sold for Rs. 160. Poudrette was prepared at Dharamgaon, Násik, and Sirúr. Street sweeping was removed by contract at Chopda. Rs. 30,776 were realized from the sale of poudrette at Poona. At Sholápur part of the sweepings was sold to the contractor for Rs. 1,518, and it is removed from the town at his own expense. Rs. 1,927 were realized from the sale of poudrette.

Latrines.—There are public latrines at most of the municipal towns, and they are cleaned by municipal sweepers. Private privies are also cleaned by the municipality at Ahmednagar, Bhingár, Shirpur, Vita, Sátára, Wái, Málcolmpeth, Sángola, Poona city, Jejuri, Ghodnadi, Sirúr, Talegaon Dábháda, and Junnar, and at the

remaining towns owners see to the cleaning. At A'landi there are neither public nor private privies. At Indápur there are public latrines, but they are not used. At Sinnar there are a few private privies, and the people resort to open places which is an intolerable nuisance: the municipality intend building more public latrines, and so overcome this difficulty.

Urinals.—The only towns that have any are Ahmednagar 21, Dhulia 3, Násik 22, Trimbak 1, Poona 15 urinals built of stone and 10 iron ones, Sholápur 6, Bársi 1, and Pandharpur 13.

Markets.—There are market buildings at Ahmednagar, Bhingár, Sangamner, Násik, Igatpuri, Sátára, Pusesávli, Málcolmpeth, Wái, Sásvad, and Poona. At the last mentioned town there are 6 meat markets besides vegetable and grain; of these 4 are municipal ones, neatly and substantially built with paved and tiled roofs and separate slaughter-houses, also a fish market; in some of the remaining towns there are open squares provided with plinth, and in others people sit on a portion of the main road on the weekly bázár days. In the Khándesh District there are no market buildings; only in 6 towns there are raised open sitting places (otas): at Dharamgaon sheds have been erected for the sale of mutton and fish.

Burial Grounds and Cremation Ghâts.—There are a few of both outside every municipal town.

New Works.—At Bhingár.—A grain market, pavement, cattle-pound, and 100 feet of paved gutter. At Sangamner Rs. 363 were spent on drains. Amalner.—New drains Rs. 318, on latrines Rs. 387, wells Rs. 147. Erandol.—New drains Rs. 1,072, dispensary Rs. 396, conservancy carts Rs. 483, wells Rs. 101. Párola.—New drains Rs. 2,662, dispensary contribution Rs. 1,206, dead-house Rs. 273. Bhadgaon.—New drains Rs. 322, dispensary contribution Rs. 1,150, conservancy carts Rs. 195, new dust bins Rs. 107. Dharamgaon.—Conservancy carts Rs. 473, temporary latrines Rs. 116, drains Rs. 116. Máheji.—Temporary latrines Rs. 31, dispensary contribution Rs. 152. Sindkheda.—3 new drains. Chopda.—160 yards of masonry gutters. Betávad.—2 masonry drains. Shirpur.—260 yards of masonry drains, 300 yards of roads, and 3 pavements in wet places. Songir.—A new dharmshála. Dhulia.—Gutters to roads, urinals, and a dharmshála. Násik.—2 new urinals and a beef market. Sinnar.—4 new latrines. Igatpuri.—A few dust bins, spring cocks to the stand-pipes, and a few lamps. At Málegaon Rs. 1,800 were spent on construction of side drains and improvement of roads. Yeola.—3 latrines Rs. 573 and 12 dust bins Rs. 86. Sirúr.—A new vegetable market. Indápur.—A new road Rs. 102. Khed.—Widening and paving the road to the river Rs. 200, and a drain paved Rs. 75. A'landi.—4 dust bins and walls have been built to the dharmshála. Sásvad.—A well Rs. 206. Sholápur.—Rs. 2,939 on 11 stand-pipes. Bársi.—8 roads, 3 latrines, a well, 2 gutters to streets, a bridge and a mutton market. Karmála.—A new dharmshála. Pandharpur.—Verandahs to 2 dharmsháls, and a municipal toll-house. Sángola.—Rs. 41 for a new dharmshála.

Poona City.

	Amount of Cost.
	Rs.
1. Meat Market, Bhowáni Peth	1,568
2. Vegetable Market, Vetal Peth	3,046
3. Sets of latrines in Mangalvár, Navi and Ganesh peths	2,481
4. U-shaped gutters (running feet 2,078)	2,110
5. Extension of water-supply, including new pipes, the completion of settling beds, filters and 2 cisterns	10,707
6. Octroi nákás and weighbridges at three of them	2,238
7. Public urinaries	150
8. A complete set of buildings for a new nightsoil depôt	8,087
9. Constructing new streets and improving old ones	4,782
10. Retaining wall to Mánik nála for the improvement and protection of the Somwár road	2,114
Total ...	37,283

Ahmednagar City.

New Works.

	Rs.	a.	p.
Erecting a water cock near the City School	3	12	0
Do. do. near Ekambi Masjid	6	8	0
Towards relaying a portion of the Kapurvádi Duct with English glazed ware pipes near the Native Infantry Lines	917	4	8
Constructing a cistern in the Guzur Guli	315	3	10
Do. a waste water drain behind the High School	33	1	1
Do. a urinary near No. 1 Maráthi School	50	10	11
Tunnelling out a portion of the Kapurvádi Duct feeder line	752	5	4
Constructing a waste water drain near A'tmárám Hari's garden	15	2	9
Do. a shaft for the Kapurvádi Duct	5	8	0
Laying a portion of the Vadgaon, deviating the old portion with English glazed pipes in Gulam Alli's bág	279	0	6
Erecting a water cock near Mungal Gate for Mhárs	46	3	9
Fixing boundary marks on the lines of aqueducts	63	8	3
Constructing a waste and ablution water drain from the A'nandi public latrines	409	12	11
Erecting a water cock in the Mungal Bázár	29	12	6
Constructing a coondi for the A'nandi Duct	7	7	0
Relaying a portion of the A'nandi Duct with English glazed pipes outside the Dele Gate	29	5	10
Constructing new dust bins	5	7	0
Do. a pavement round the cattle trough in the Stewart Cotton Market	143	13	2
Reconstructing a portion of the privy for municipal office	2	0	0
Constructing a gutter in the Navi Peth	267	2	8
Reconstructing Bráhmin Karanja "Cistern"	490	11	2
Constructing a drain near the Ekambi Masjid	102	3	7
Constructing a drain in the Satbhair Guli	159	2	7
Do. a coondi to the public latrine outside the Málivada Gate ...	2	9	10
Do. a new privy in the Cotton Market	393	3	11
Do. a water trough outside the Málivádá Gate	12	0	0
Do. a screen wall for the Tophkhána latrines	41	14	11

Repairs.

Mutton market	14	9	0
Beef do.	24	3	8
Underground drains	133	4	2
Urinaries	12	10	11
Kapurvádi Aqueduct	336	7	2
Vadgaon do.	562	5	2
Nagábáu do.	239	9	8
A'nandi do.	27	1	0
Zirahs in the Sina River	14	14	3
Wells and water troughs	36	7	10
Purchasing iron pipes to replace the old ones	69	11	4
Moat expenses on Nagábáu Aqueduct	299	1	3
Ditto Vádgaon do.	50	8	4
Repairs to old dust bins	66	14	1
Do. to public latrines	77	15	3
Ds. to municipal bullock shed	9	14	0
Do. to public wells	7	15	0
Expense incurred for repairing private privies (the cost to be recovered from the owners)	139	14	9
Total Rs. ...	6,728	7	0

SOUTHERN DIVISION.

Districts.	Name of Municipality.	Population.			Annual Income.	Expenditure on Conservancy.
		Males.	Females.	Total.		
					Rs.	Rs.
Kánara.	1. Kárwár	7,155	6,606	13,761	10,364	3,105
	2. Kumta	5,571	5,058	10,629	10,065	10,001
	3. Sirsi	3,042	2,591	5,633	10,388	6,059
	4. Haliyál	2,695	2,832	5,527	4,898	1,229
	5. Gokarn	2,163	2,044	4,207	1,583	276
	6. Ulvi, Temporary ...	112	115	227	785	7
	Total ...	20,738	19,246	39,984	38,083	20,677
Belgaum.	7. Belgaum	12,027	11,088	23,115	35,461	21,194
	8. Yamkanmardi ...	2,674	2,622	5,296	2,384	404
	9. Nipáni	5,063	4,714	9,777	11,913	16,686
	10. Saundatti	3,446	3,687	7,133	1,906	493
	11. Gokák	5,129	5,178	10,307	5,951	2,902
	12. Yellama	...	...	...	4,769	197
	13. Athni	5,466	5,720	11,186	12,760	4,288
	Total ...	33,805	33,009	66,814	75,144	46,114
Kaládgi.	14. Kaládgi	3,628	3,396	7,024	2,829	1,168
	15. Bágalkot	6,301	6,549	12,850	11,731	1,626
	16. Ilkal	4,867	4,707	9,574	6,929	1,178
	17. Bijápur	5,560	5,864	11,424	3,161	1,095
	Total ...	20,356	20,516	40,872	24,650	5,067
Ratnágiri.	18. Vengurla	4,477	4,470	8,947	16,943	3,037
	19. Rájápur	3,742	3,706	7,448	15,610	9,173
	20. Ratnágiri	6,418	6,198	12,616	6,333	16,355
	21. Chiplún	6,646	5,419	12,065	8,380	6,082
	22. Dápoli	1,246	1,216	2,462	671	586
	Total ...	22,529	21,009	43,538	47,937	35,233
Dhárwár.	23. Dhárwár	13,160	13,360	26,520	27,254	6,069
	24. Hubli	17,972	18,705	36,677	31,394	13,548
	25. Gadag-Betigeri ...	8,322	8,679	17,001	15,787	2,002
	26. Navalgund	3,743	4,067	7,810	4,887	781
	27. Nárgund	3,858	4,016	7,874	4,368	751
	28. Hángal	2,589	2,683	5,272	628	316
	29. Háveri	2,749	2,903	5,652	3,798	1,950
	30. Byádgi	2,055	2,061	4,116	6,435	649
	31. Ránebennur ...	5,061	5,141	10,202	4,599	1,028
	32. Guddguddápur (temporary)	279	266	545	527	32
	Total ...	59,788	61,881	121,669	99,677	27,126
	Grand Total ...	157,216	155,661	312,877	2,85,491	1,34,217

Water-supply.—The existing arrangements in the above municipal towns are the same as those of last year. At Sirsi 3 new wells were constructed, and sheds to 2 wells. Ulvi gets its supply from a spring water tank. At Nipáni a new tank with an earthen enbankment has been made near Shirgapi, and a masonry reservoir 100 × 100 × 8 feet has been made near Nipáni. The new tank will be connected by pipes with the old tank, and water will be distributed by pipes. "Kumbhar well" at Athni was rebuilt by the municipality; it contains

very good water. At Ratnágiri the water from the reservoir is carried by iron pipes into the town, and the inhabitants get their supply from stand-pipes. The new Chiplún water works are nearly completed. A new circular well is being built on the bank of Moti tank at Dhárwár. At Háveri steps have been taken for purifying the drinking water supplied from the tank, by diverting one of the old channels, which passed through a burial ground, to pass though a cleaner soil and to bring water from better sources; also a silting pond was constructed.

Drainage.—In most of the municipal towns the principal streets have open side drains and the others mere cuttings. At Kumta a new stone drain has been constructed by the side of the principal market road and new drains have also been built by the side of a new road. Rs. 494 were spent at Sirsi in lining the side drains with laterite stone masonry. The side drains are covered with slab-stones at Haliyál, and regular sewers have been excavated in the streets. A new cross drain was made at Gokarn. Some of the masonry gutters at Belgaum are covered with slab-stones; they are opened annually and cleaned. In the following towns the main streets have covered drains:—Athni, Rájápur, Hubli and Ránebennur. There are no drains at Yamkanmardi, Nipáni, Vengúrla, Dápoli, Byádgi, and Guddguddápur.

Cesspools.—There are no municipal cesspools. At Kánara the refuse water from the houses in the bázár is removed, at the cost of the owners, by means of iron receptacles placed in the rear of the houses, and they are emptied daily. Nipáni has 2 cesspools in the south. At Athni and Kaládgi most of the private houses have—Bijápur has 29, and they are cleaned by the municipality. Some of the private houses at Háveri have them. Hubli has a great number, and they are of great depth, and are never cleaned. At Gádag Betigeri all the well-to-do persons have cesspools attached to their houses, and they are never cleaned. At Ránebennur there are 29, and they are cleaned out periodically by the municipality.

Scavengering.—An establishment is kept by each municipality to keep the towns and streets clean. At Ratnágiri, street sweepings are removed by hired coolies. Street sweepings are generally sold at most of the municipal towns. At Kárwár a piece of low ground is being reclaimed by it. At Kumta it has been utilized in reclaiming certain offensive marshes: the municipality of this town purchased 4 cart dust bins, and have found them be a decided improvement on fixed dust bins. Street sweepings are burnt at Sirsi; cart dust bins were also introduced in this town. Sweepings at Vengúrla were carted to a salt marsh which is being reclaimed. They are utilized at Bágalkot for filling up hollows.

Latrines.—The majority of the municipal towns in this division have no latrines, the inhabitants resorting to fields on the outskirts of the towns for natural purposes. The following towns have them, and they are cleaned by municipal sweepers:—Kárwár, Belgaum, Gokák, Bijápur, Dápoli, Rájápur, Dhárwár, and Hubli. Private latrines at Kárwár are also served by municipal sweepers, and the nightsoil of this town and also of Kumta, Belgaum, Gokák, and Athni are carted away to a distance and buried. Trench system of latrines exists at Sirsi. At Kumta there are no public latrines, and the municipality are under the impression that the time has not yet come for introducing them: there are a few private ones, and they are attended to by municipal sweepers. At Ilkal on two sides of it fields have been bought and set apart for use as latrines. At Bágalkot and Kaládgi there are latrines on the dry-earth system reserved for females; the men resort to fields. At Ratnágiri private privies are served by municipal sweepers. At Hubli, 2 fields to the north and south of the town were acquired for the disposal of nightsoil and road sweepings.

Urinals.—The only towns that have any are, one at Sirsi built by the municipality for the boys of the Anglo-Vernacular school, and there are a few at Dhárwár and Hubli.

Markets.—There are markets at the following towns:—Kárwár, Kumta, Sirsi, Belgaum, Athni, Bijápur, Dhárwár, Hubli, and Háveri, they are washed out

daily and kept clean. At Ratnágiri the foundation of a fish market has been laid, and a temporary straw thatched shed erected on it.

Burial Grounds and Cremation Ghâts.—There are a few of both at each place, and they are outside the towns.

New Works.—At Kárwár 2 new latrines. Háliyal.—20 lamp posts. Ulvi.—Improving road Rs. 292. Sirsi.—2 new wells, 2 sheds over wells, side drains to roads and a dust bin. Kumta.—A masonry drain. Gokarn.—A new cross drain. Nipáni.—A tank and a masonry reservoir. Belgaum.—10 roads with side gutters, renewing the roof of the vegetable market, paving the floors of slaughter-house, a new well, and5 new lamp posts. Athni.—A new well, Rs. 1,775. Saundatti.—Roads repaired, lantern posts setup, and dust bins constructed. Yamkanmardi.—A new road at a cost of Rs. 120. Yellama's Hill.—2 roads, fixing of guardstones on the sides of the roads, walls on the sides of the bridge over the nála. Kaládgi.—Part of a road, 2 lamp posts and 3 dust bins. Ratnágiri.—A store-house for storing the water-works apparatus, a stone wall around the Nachne dam, a new distribution pipe. Dhárwár.—58 dust bins Rs. 614, 55 cross drains Rs. 1,234, masonry drains Rs. 2,352, a market costing Rs. 1,200, 70 new lamp posts, paving the floor of the slaughter-house at a cost of Rs. 266. Hubli.—2 latrines, 1 urinal, 3 dust bins, masonry drains and a well. Gadag Betigeri.—A new well at a cost of Rs. 1,262, a latrine. Nárgund.—Rs. 2,044 were spent in deepening 2 tanks, Rs. 109 on wells, and Rs. 129 on road-side drains. Ránebennur.—Rs. 402 on roads. Byádgi.—Rs. 1,285 on roads and Rs. 2,365 on a dharmshála. Hángal.—15 dust bins and a culvert. Háveri.—Masonry drains and silting pond in the tank.

SIND DIVISION.

Districts.	Name of Municipality.	Population. Males.	Females.	Total.	Annual Income.	Expenditure on Conservancy.
					Rs.	Rs.
Karáchi.	1. Karáchi	39,803	28,439	68,332	2,39,132	44,161
	2. Kotri	5,207	3,715	8,922	13,128	4,269
	3. Mánjhand	1,387	1,267	2,654	1,308	439
	4. Sehwan	2,379	2,145	4,524	5,924	1,567
	5. Bubak	1,453	1,383	2,836	3,262	578
	6. Dádú	1,295	975	2,270	2,436	771
	7. Johi	612	507	1,119	1,276	309
	8. Tatta	4,320	4,510	8,830	12,236	1,641
	9. Keti	1,230	911	2,141	7,715	726
	10. Mirpur Batoro	1,708	1,394	3,102	5,522	1,030
	Total ...	59,484	45,246	104,730	2,91,939	55,491
Hyderabad.	11. Hyderabad	23,337	21,858	45,195	1,62,957	10,831
	12. Tando Jam	1,045	1,027	2,072	979	300
	13. Tando Muhammad Khán ...	1,763	1,522	3,285	4,765	1,104
	14. Hála	2,009	1,960	3,969	2,768	843
	15. Matári	2,566	2,488	5,054	2,703	867
	16. Tando Alayhar	2,321	1,849	4,170	6,715	1,097
	17. „ Adam	2,240	1,996	4,236	7,042	732
	18. Nasarpur	1,623	1,585	3,208	2,028	576
	19. Sháhdádpur	1,155	912	2,067	2,853	511
	20. Kandiaro	1,061	1,306	2,367	1,476	372
	21. Nánabhro	1,553	1,557	3,110	1,373	369
	22. Thára Sháh	1,084	1,152	2,236	1,044	360
	23. Bhiria	1,100	1,388	2,488	1,742	309
	24. Moro	1,059	1,008	2,067	944	251
	Total ...	43,916	41,608	85,524	1,99,389	18,522

Districts.	Name of Municipality.	Population.			Annual Income.	Expenditure on Conservancy.
		Males.	Females.	Total.		
					Rs.	Rs.
Shikárpur.	25. Shikárpur	22,889	19,607	42,496	70,038	32,500
	26. Sukkur	17,151	10,238	27,389	1,07,761	12,082
	27. Garhi Yásin	2,965	2,576	5,541	5,870	1,292
	28. Lárkhána...	7,155	6,033	13,188	22,686	2,857
	29. Kambar	3,305	2,828	6,133	6,883	1,238
	30. Rato-dero	1,691	1,366	3,057	3,652	903
	31. Mehár	1,165	779	1,944	2,182	240
	32. Khairpur Nátheshán ...	973	794	1,767	1,376	180
	33. Rohri	5,361	4,863	10,224	14,630	5,447
	34. Ghotki	1,743	1,002	2,745	2,769	346
	35. Ubauro	1,404	1,181	2,585	926	189
	Total ...	65,802	51,267	117,069	2,38,773	57,274
Thar and Párkar.	36. Umarkot	2,329	1,670	3,999	6,763	979
	37. Mitti	1,707	1,173	2,880	2,566	366
	38. Nagar	1,408	1,017	2,425	3,298	320
	Total ...	5,144	3,860	9,004	12,627	1,665
Upper Sind Frontier.	39. Jacobabad	4,375	2,990	7,365	29,590	3,920
	Grand Total ...	178,721	144,971	323,692	7,72,318	1,36,872

Water-supply.—The existing arrangements in the above municipal towns are the same as those of last year. The works connected with the supply of water to Karáchi from the Mulleer River are progressing steadily, and will be completed soon. At Johi a well was closed, as its water was brackish and unfit for use. Two tanks out of 17 at Tatta were cleaned at municipal expense. At Hyderabad the following additions were made in the arrangements for water-supply:—two services were put up at the mutton slaughter-yard, one bullock bhisti service, and one four-cock hand service at the carriage stand; 4 new single cock service in the main bázár; 1 four-cock bullock service at the fish market. At Shikárpur a new well has been sunk: of the 165 wells 72 are under municipal control. Two public masonry wells were built during the year at Sukkur. Gotki from 43 wells: of these 2 are public and 41 are owned by private individuals. Ubauro from 42 wells: of these 13 are for drinking and domestic purposes. At Jacobabad 7 of the municipal wells have been covered over to prevent dead leaves, &c., from falling into them.

Drainage.—The major number of the municipal towns have no drains. Karáchi has no proper system of drainage. The street drains were formerly ditches in front of the houses, which were chiefly receptacles for filth; these are now being filled up and replaced by shallow saucer drains in connection with paved foot-paths. Sehwán has no drains, but there are 16 culverts on the roads to take away rain water. Johi also has no drains, but a culvert at one extremity of the town for carrying away rain water. Tando Adam has 2 drains—one of masonry in the south and the other of unburnt brick in the north. At Hyderabad city the scheme for the systematic drainage of the whole of the city and the utilization of the waste water of the city will be pushed on during the next cold season. The following towns have drains for carrying off rain water:—Tando Muhammad Khán, Tando Jam, Lárkhána, and Rato-dero. The drainage of Sukkur town is very defective, but a scheme for its better drainage is under consideration. Shikárpur, purely surface drainage. At Jacobabad in the main as well as in the side streets of the larger part of the town there are open side drains of

burnt brick and mud, and in the thinly populated part of the town which lies to the south the road-side gutters serve as drainage channels.

Cesspools.—There are no municipal cesspools. Karáchi has about 600 covered cesspools; these are cleaned out periodically, and the contents carted away in closed iron carts. Sukkur has a number of cesspools; they are a source of trouble, it being very difficult to make the people keep them clean. At Shikárpur those emptied by the municipal servants are kept clean and deodorized with quicklime. At Lárkhána 2 reservoirs for refuse water were constructed at a cost of Rs. 278; they are cleaned daily by the municipality.

Scavengering.—Sweepers are employed by each municipality to keep the towns and streets clean. Street sweepings are generally burnt, as there is no demand for them. At Rohri it was sold. At Bubak the cultivators take away the street sweepings for agricultural purposes. At Bhiria, Ghotki, and Ubauro the street sweepings are thrown on fields, and at Khairpur it is buried. Poudrette was manufactured at Sukkur.

Latrines.—There are public latrines at almost all the municipal towns in the Sind Division, and they are kept clean by municipal sweepers. The nightsoil is removed to a distance, and either buried or deposited with the street sweepings. The following towns have no public latrines:—Nasarpur, Ghotki, Khairpur, and Mehar.

Urinals.—None.

Markets.—There are markets at most of the municipal towns; they are kept clean and washed out daily. There are no market buildings at Tando Adam, Shâhdâdpur, Bhiria, Garhi Yâsin, Khairpur, Ghotki, Ubauro, Mitti, and Nagar.

Burial Grounds and Cremation Ghâts.—There are several at each place, and they are outside the towns.

New Works.—Karáchi.—Paving streets and lanes of the native town and sadar bázár; some of the deep drains have been filled up, and shallow saucer drains laid in their places; the market at Lyari was taken down and replaced by a brick structure; a wall by the bank of the river for protecting the city; a new dispensary at a cost of Rs. 12,804: one-half of the cost has been borne by a Pársi gentleman by name Eduljee Dinshaw. Kotri.—4 new latrines Rs. 1,233, a road Rs. 17, and 5 culverts to roads Rs. 715. Tatta.—4 walled enclosures for burning the sweepings at a cost of Rs. 119. Mirpur Batoro.—2 bullock carts, a fish market and a masonry bridge. Moro.—A culvert at a cost of Rs. 140. At Hála Rs. 148 were expended on repairs to market, hospital and dispensary. At Hyderabad city the following works were done:—a new house for Dabgirs outside the city, stable for cattle, draining and paving Siri bázár, water service, drainage and paving Jhuramal's lane, water service, drainage of service tank near Government telegraph office, paving and drainage of Amir Sháh's lane, drainage of water from Eastern Postal road service, paving and drainage Visarám lane, enlargement and improvement of the slaughter-yard. At Tando Jam a musafurkhána, a municipal hall, 2 drains and 2 bathing ghâts were constructed during the year,—the total cost of these works being Rs. 1,411. Umarkot.—Repairs to wells and latrines at a cost of Rs. 177. Mitti.—Repairs to wells and latrines at a cost of Rs. 175. Nagar.—A market Rs. 1,023 and repairs to wells and latrines Rs. 123. Jacobabad.—A large dharmsháld near the railway station, a stable, a new public latrine and 7 sheds on wells. Sukkur.—2 public wells, a slaughter-house and a shed. Shikárpur.—A new well, medical officer's quarters at the dispensary, and 3 streets paved with brick. Rohri.—A drain and a latrine. Garhi Yásin.—Improvement to wells Rs. 673, cutting of jungle and removing rank grass in the neighbourhood of the town Rs. 30. Lárkhána.—A slaughter-house and 6 new bridges.

LOCAL FUND CIRCLES.

AHMEDABAD DISTRICT.

Annual income and expenditure of the Local Funds of the Ahmedabad Collectorate for the year 1881-82 are :—

		Rs.
Annual income of District Public Works Funds ...	...	1,15,473
Expenditure on sanitary works, as detailed below	...	73,818

On account of Local Fund on vaccination Rs. 3,477, out-offices to the dispensary at Modása Rs. 121.

The following new works were executed during the year by the Civil Agency at a total cost of Rs. 2,836 :—Two wells in Dhandhuka Táluka, 1 in Viram, 1 in Sánand and 1 on the road from Paránti] to Tájpur. Repairs were done to the following by the same agency at a total cost of Rs. 4,970:—3 tanks, 1 well and trough in the Sánand Táluka, 2 tanks and 1 trough in Dholka, 3 tanks in Dhandhuka, 1 well in Viramgám, and to 1 well and 1 drain in Gogha. New roads by Public Works Department Rs. 27,909. Repairs to roads by Civil Department Rs. 7,103; by Public Works Department Rs. 20,226. Travellers' bangalow Rs. 532, dharmsháláa Rs. 1,075.

Building school-houses—1 in Sánand, 1 extension in Daskroi and 1 in Paránti]—Rs. 2,412.

Repairs to school-houses—by Civil Department Rs. 2,900 ; by Public Works Department Rs. 244.

KAIRA DISTRICT.*

The annual income and expenditure of the Local Fund circles, Mátar, Thásra, Kapadvanj, Nadiád, Borsád, Anand, and Mehmadabad, for the year 1881-82, are :—

Population.			Income.	Expenditure on water-supply and water-works, &c.
Males.	Females.	Total.		
			Rs.	Rs.
419,142	363,591	782,733	1,41,431	25,741

Water-supply from 320 wells and 242 tanks.

New Works.—In Mátar Táluka 2 tanks, Rs. 842. In Thásra Táluka 2 wells Rs. 1,352 and one tank Rs. 479. Kapadvanj.— Two wells Rs. 600. Nadiád.—One well Rs. 725, and 4 tanks Rs. 2,579. Borsád.—Three wells Rs. 1,416 and 3 tanks Rs. 5,246. Anand Táluka.—One well Rs. 561 and 4 tanks Rs. 4,066. In Mehmadabad Táluka a well Rs. 165.

PANCH MAHA'LS DISTRICT.

Local Fund Circles.	Population.			Annual Income.	Expenditure on Conservancy.
	Males.	Females.	Total.		
				Rs.	Rs.
Godhra, Kálol, Hálol, Dohad and Jhálod	131,162	124,317	255,479	40,375	315

In the above Local Fund circles no new works were executed, but wells and tanks were repaired, and large amounts were spent on roads. In Hálol Circle a new well was completed.

BROACH COLLECTORATE.

Local Fund Circle.	Population.			Annual Income.	Expenditure on Conservancy.
	Males.	Females.	Total.		
				Rs.	Rs.
Broach District	168,482	158,448	326,930	1,99,486	121

Water-supply from 2,111 wells; of these 47 are with steps, and 968 tanks. There are also 4 streams used for drinking purposes.

New Works.—Twenty-six tanks (excavating and repairing) Rs. 9,946, 12 wells (cleaning and repairing) Rs. 3,959, repairing 2 dharmshálas Rs. 166, and repairing 8 roads Rs. 1,735.

SURAT COLLECTORATE.

Local Fund Circle.	Population.			Annual Income.	Expenditure on Conservancy.
	Males.	Females.	Total.		
				Rs.	Rs.
Surat District	306,015	308,183	614,198	1,73,865	Nil.

Six new tanks were constructed, Rs. 556; and 23 wells and cattle troughs, Rs. 7,054. Besides, Rs. 6,347 were spent on repairs to tanks, and Rs. 3,660 on repairs to wells.

THA'NA COLLECTORATE.

Local Fund Circle.	Population.			Annual Income.	Expenditure on Conservancy.
	Males.	Females.	Total.		
				Rs.	Rs.
Thána District	468,236	440,312	908,548	1,75,958	None.

New Works.—Salsette Táluka.—A new well Rs. 590 and a trough to a well, Rs. 83. Thána.—Water-supply project was completed at a total cost of Rs. 82,314; 2 tanks cleared, Rs. 1,133. Panvel Táluka.—Two wells were constructed and a tank cleared, total cost Rs. 1,384. Karjat Táluka.—Two new wells Rs. 1,050. Murbad Táluka.—A well was constructed and one repaired at a cost of Rs. 1,143. Sháhápur Táluka.—A well was constructed, and 3 were repaired, and a tank cleared at an aggregate cost of Rs. 2,020. In táluka Váda 1 well was constructed and 1 repaired and a tank cleared at a total cost of Rs. 695. In Táluka Dahánu 2 wells were constructed and 7 repaired and a tank cleared at a total cost of

Rs. 1,644. In Bhiwndi Táluka a well was constructed and 1 repaired and a tank cleared at a cost of Rs. 1,568. In Máhím Táluka a well was constructed for Rs. 349. In Kalyán Táluka 2 wells constructed and 2 repaired at a cost of Rs. 1,262.

KOLA'BA COLLECTORATE.

Local Fund Circle.	Population.			Annual Income.	Expenditure on Conservancy.
	Males.	Females.	Total.		
				Rs.	Rs.
Kolába District...	191,952	189,697	381,649	47,978	4,752

New Works.—The project for supplying water to the town of Rho and 6 adjoining villages cost Rs. 19,869. Six new wells were constructed—2 in Alibág, 3 in Mángaon and 1 in Mahád Táluka—at a cost of Rs. 1,447, and Rs. 670 were spent on repairs to existing wells and tanks.

AHMEDNAGAR COLLECTORATE.

The following works were executed in this district during the year 1881-82 out of Local Funds:—Rs. 301 were expended for deepening 4 wells, Rs. 85 for clearing 8 wells, Rs. 876 were expended for repairing 11 wells, 3 wells were constructed at a cost of Rs. 712, for improving 2 wells Rs. 740 were spent, and for fencing off the steps of a well Rs. 20 were expended.

KHA'NDESH COLLECTORATE.

Local Fund Circle.	Population.			Annual Income.	Expenditure on Conservancy.
	Males.	Females.	Total.		
				Rs.	Rs.
Khándesh District	90,183	86,119	176,302	29,947	7,128

The water-supply is from wells, tanks and rivers.

New Works.—In Nandurbár Táluka 2 new wells were constructed. In Viratkál 2 new wells were sunk. In Chopda Táluka a well was repaired and one was sunk in the bed of a river. In Amalner Táluka 2 new wells Rs. 859, a pavement to a well and trough Rs. 150, and repairs to wells Rs. 444. In Erandol Táluka 2 new wells Rs. 626, and repairs to one, Rs. 125. In Páchora Táluka repairs to wells, Rs. 200. In Chálisgaon Táluka, repairs to well and dharmshála, Rs. 184.

NA'SIK COLLECTORATE.

Local Fund Circle.	Population.			Annual Income.	Expenditure on Conservancy.
	Males.	Females.	Total.		
				Rs.	Rs.
Násik District	398,236	376,159	774,395	1,09,156	4,129

In Peint Táluka Rs. 50 were expended on repairs to wells. In Báglan Táluka a new well was constructed Rs. 100, and existing wells were repaired at a cost of Rs. 117. In the following tálukas the amounts shown opposite them were spent on repairs to wells:—Málegaon Rs. 822, Nándgaon Rs. 555, Kalvan Rs. 200, Niphád Rs. 82, Násik Rs. 200. In Igatpuri Táluka 4 new wells were constructed at a total cost of Rs. 1,445. In Dindori Táluka a new well was built for Rs. 400, and on repairs to wells Rs. 525 were expended. In Chándor Táluka a new well was built for Rs. 500, and Rs. 70 spent on repairs to wells. In Yeola Táluka 3 new wells Rs. 1,600, temporary wells in the beds of 8 rivers Rs. 518, and Rs. 300 were expended on repairs to wells.

POONA COLLECTORATE.

Local Fund Circle.	Annual Income.	Expenditure on Conservancy.
	Rs.	Rs.
Poona District	1,18,347	7,904

Eight new wells were constructed at a cost of Rs. 3,254, cattle troughs have been built to 3 wells, and 15 wells repaired at a cost of Rs. 3,390. A lamp has been provided at a cost of Rs. 15 to the Bhigwán well for the convenience of railway passengers arriving at night and putting up at the dharmshála. At Lonávla pipes were laid down and hydrants erected at a cost of Rs. 560, and a pipe has been laid on to the dharmshála at Dhond from the railway main for the use of travellers at a cost of Rs. 372. Three wells were constructed and repaired at a cost of Rs. 91.

SA'TA'RA COLLECTORATE.

Local Fund Circle.	Annual Income.	Expenditure on Conservancy.
	Rs.	Rs.
Sátára District	57,556	4,034

Water-supply from wells, rivers and tanks; smaller villages depend upon springs in nálas. In the tálukás of Sátára, Wái, Koregaon and Jávli, money has chiefly been spent on repairs to roads and planting trees. In Khatáv Táluka Rs. 150 were spent on repairs to wells, &c., in about 13 villages and a well was constructed. In Mán Táluka a well was constructed at a cost of Rs. 100. In Tásgaon Táluka Rs. 99 were expended in repairing old wells.

SHOLA'PUR COLLECTORATE.

Local Fund Circle.	Males.	Females.	Total.	Annual Income.	Expenditure on Conservancy.
				Rs.	Rs.
Sholápur District	248,222	241,596	489,818	71,086	3,828

KANARA COLLECTORATE.

Local Fund Circles.	Population.			Annual Income.	Expenditure on Conservancy.
	Males.	Females.	Total.		
				Rs.	Rs.
Kumta Táluka	21,354	22,568	43,922	19,400	...
Honávar do	42,439	43,186	85,625	...	...
Sirsi do.	33,356	23,411	56,767	7,595	3,204
Siddápur do.	20,446	15,212	35,658	6,039	1,309
Ankola do.	17,648	16,220	33,868	7,826	...
Kárwár do.	24,843	23,521	48,364	6,308	...
Yellápur do.	17,053	15,390	32,443	7,365	550
Supa do.	25,931	24,431	5,362	4,977	860
Total ...	203,070	183,939	387,009	59,510	5,923

Water-supply.—In Kumta Táluka there are 6,674 wells and 1,026 tanks. Eight wells and 2 tanks belong to the Local Fund Department. In Honávar from springs, wells and tanks. Sirsi Táluka from wells and tanks. In Siddápur Táluka there are 474 tanks and 1,531 wells; of these 6 wells belong to Government. At Ankola from wells and tanks; there are about 2,715 wells and 585 tanks. At Kárwár Táluka there are 3 spring water tanks and 6 public wells; there are, besides, 2,593 private wells. In Yellápur and Supa tálukas from springs, rivers, wells and tanks.

Drainage.—Roads in villages have mere cuttings to carry away rain water.

New Works.—Kumta Táluka.—Ferry boats and jangals Rs. 750, a new well Rs. 297, a stable and privy for the bungalow at Santgal Rs. 50, and special improvements to the tank at Devgi Rs. 499. Sirsi Táluka.—On roads Rs. 1,399 were spent, and Rs. 497 on repairs to a tank. Siddápur Táluka.—Rs. 1,500 were expended on roads and Rs. 99 on gutters to roads. Ankola Táluka.—A rest-house Rs. 150, on roads Rs. 300 were spent, and Rs. 160 on repairs to ferry sheds. Yellápur Táluka.—Two new wells Rs. 550 and a cattle-pound Rs. 190. Supa Táluka.—A well and a cattle-pound were built.

KALA'DGI COLLECTORATE.

Local Fund Circle.	Population.			Annual Income.	Expenditure on Conservancy.
	Males.	Females.	Total.		
				Rs.	Rs.
Kaládgi District	317,611	320,882	638,493	1,66,281	869

Water-supply from rivers, wells and tanks. There are in this district 134 tanks, 3,571 wells with steps and 2,326 wells without steps, 109 nálas the waters of which constantly flow throughout the year, and 547 nálas flow occasionally during the year.

New Works.—A dispensary (completed) Rs. 9,309, and Rs. 772 were expended on another which is in progress, Rs. 6,102 were spent on constructing 10 wells and Rs. 16,069 on 2 tanks.

DHA'RWA'R COLLECTORATE.

Local Fund Circle.	Population. Males and Females.	Annual Income.
		Rs.
Dhárwár District	691,070	1,33,956

In Hubli Táluka Rs. 470 were expended in improving a tank. At Kalghatgi Táluka Rs. 1,987 were spent on deepening and improving 2 tanks. At Bankápur Táluka a new well was constructed at a cost of Rs. 1,168. Four tanks were repaired in Navalgund Táluka at a cost of Rs. 12,328. Ron Táluka.—A new well Rs. 200, and a tank repaired at a cost of Rs. 1,030.

KARA'CHI COLLECTORATE.

In this district the total receipt for the year 1881-82 was Rs. 87,620, and on repairs to works of public improvements Rs. 1,173 were expended.

HYDERABAD COLLECTORATE.

Local Fund Circle.	Population. Males and Females.	Annual Income.	Expenditure on Conservancy.
		Rs.	Rs.
Hyderabad District	754,624	1,05,843	2,341

Water-supply.—There are 132 wells maintained out of Local Funds, and situated chiefly in towns and villages and a few on roads. Thirteen tanks are also maintained at the expense of Local Funds.

New Works.—Three new wells were constructed at a cost of Rs. 1,855, and Rs. 486 were expended on repairs to wells.

SHIKÁRPUR COLLECTORATE.

Local Fund Circle.	Population. Males and Females.	Annual Income.	Expenditure on Conservancy.
		Rs.	Rs.
Shikárpur District	407,835	75,613	10,044

Water-supply from wells and tanks.

New Works.—In Mehár Táluka a well was constructed. In Lárkhána Táluka 2 wells were repaired at a cost of Rs. 80. In Kambar Táluka a new well was constructed for Rs. 200 and a well repaired at a cost of Rs. 40. Labdárya Táluka.—Wells were repaired for Rs. 90. Sujáwal Táluka.—Two new wells were constructed at a cost of Rs. 700.

THAR AND PARKAR COLLECTORATE.

Local Fund Circle.	Population.			Annual Income.	Expenditure on Conservancy.
	Males.	Females.	Total.		
				Rs.	Rs.
Thar and Párkar District ...	105,575	75,186	180,761	23,610	915

A new well was constructed at Ranikder in táluka Khipra for Rs. 300 and 3 wells in Umarkot Táluka at a total cost of Rs. 2,400, and Rs. 315 were expended on repairs to wells and tanks.

SECTION VI.

GENERAL REMARKS.

Very little touring has been done since March of last year, but fortunately Mr. Hewlett has been on special and independent duty which entailed the inspection of every station where there are British troops; and the results of his inspections will be embodied in an independent report to Government in the Military Department.

THE GHORPURI LINES AT POONA.

2. For some years these lines have been acquiring an increasing notoriety as very hot-beds of malaria, and of late regiment after regiment has been so reduced in efficiency by admissions into hospital from paroxysmal fever, that abandonment of the site has been talked of. This site has been described over and over again, and by abler pens than mine; but in now speaking of it, I have the advantage of plans and sections specially prepared by Colonel Ducat, R.E., and with their help I may perhaps place local conditions in a yet clearer light.

3. The general map gives the strictly military area of the Cantonment, and the green patches represent land cultivated and irrigated from the Khadakvásla Canal. There are lines for 2 British and 3 Native Regiments of Infantry and one Regiment of Native Cavalry: this last, however, is somewhat isolated, so the actual site to be noticed is that occupied by the Infantry.

See map of Poona Cantonment.

4. The geological formation is that of the great trap area of the Deccan. The rock everywhere is trap, sometimes cropping out at the surface, and the soil is moorum in varying degrees of consistency, with here and there the well-known "black cotton soil" itself disintegrated trap. Roughly speaking the area drains east and west into flanking nálás, and northwards to the Mutha-Mula River.

Physical characters.

5. The longitudinal section starts from the bench mark at the north-east corner of the Wanouri Hospital plinth: it bisects the barrack area, skirts the race-course, passes between the first and second rows of the Ghorpuri barracks, through the eastern side of the hospital enclosure, and crossing the railway is continued to the river: the total length of the line is given as 16,547 feet; the datum is 50 feet below low-water level of river at a fixed point; the difference in height between the terminal points is 241 feet, and the average fall is about 68 feet, or 22 feet per mile. It will be more convenient to divide this area into three portions, thus:—

Longitudinal section. See Plate I.

See Plate 3.

1. From Wanouri to canal.
2. From canal to railway.
3. From railway to river.

The first portion is separate and distinct, for in its passage across the race-course from the western to the eastern nála, the Khadakvásla Canal has its channel in solid rock, so it is an effective barrier against the passage of surface washings or sub-soil impurities from the occupied area on the south: indeed, as far as drainage is concerned, it cannot be said that Ghorpuri to the north is in any way affected by Wanouri on the south. The third portion is more or less "black cotton soil", cultivable and cultivated: there is little slope east or west to the flanking nálás, but the fall northwards to the river bespeaks good drainage. The second portion is that which more especially commands attention, for within the flanking nálás it contains the Native Infantry lines, the Ghorpuri barracks with their subsidiary buildings, and the officers' bangalows. From the canal to No. 5 barrack, the nearest, the distance is 3,600 feet, and all of it, east of the Native Infantry lines, is open and unoccupied: it is the general parade ground and race-course, is well cared for, and well drained to the eastern

From Wanouri to canal.

From railway to river.

From canal to railway.

nála. The Native Infantry lines are on the slopes of the western nála, and the fall to it is more than sufficient; but their left flank overlaps the left flank of the Ghorpuri barracks directly to leeward, and only some 1,000 feet distant. The front of the lines proper is open and unoccupied, and there is ample fall to the western nála; but in parts there is "black cotton soil", the ground is somewhat broken, and there is much room for improvement. The objectionable lascar lines have been removed.

Officers' bangalows.

In rear of the barracks, on the east, are the officers' bangalows. Low lying on deep black soil, badly built and worse cared for, without adequate plinths, and until lately without drainage, the only wonder is they have been tolerated so long: it is not too strained to speak of them as barely habitable.

Barrack area and flanking nálás.

6. The immediate area of the barracks and their surroundings, together with the flanking nálás, will be seen on Plate 2: the longitudinal sections are shown on Plate 4, and the cross sections on Plate 5. For the sake of convenience the levels on the north and south lines are here tabulated:—

Points.		Length in feet.		Difference of level in feet.	Remarks.
On watershed of ridge.	A to N ...	1,110	...	15·25	
	N to O ...	1,400	...	27·57	
	O to P ...	1,250	...	13·26	
	P to B ...	1,990	...	26·42	
	Total ...	5,750	Mean.	20·62	
Western or sepoy's nála.	L to C ...	1,250	...	7·38	Level at L= 83·63
	C to E ...	1,450	...	27·56	„ „ J= 19·50
	E to G ...	1,330	...	14·49	64·13
	G to J ...	2,110	...	14·70	
	Total ...	6,140	Mean.	16·03	
					„ „ M= 78·01
					„ „ K= 30·25
Eastern or Byroba's nála.	M to D ...	850	...	5·26	47·76
	D to F ...	1,800	...	32·58	
	F to H ...	1,259	...	2·00	
	H to K ...	1,840	...	7·92	
	Total ...	5,749	Mean.	11·94	

In Byroba's nála from the soldiers' gardens to the river the average fall is 35 feet per mile.

The cross sections, or E and W lines, on Plate 5 are similarly tabulated:—

Points.		Length in feet.	Difference of level in feet.
Western fall	A to M	2,240	39·62
	N to D	2,174	31·08
	O to F	2,770	34·64
	P to H	3,130	23·38
	B to K	2,650	9·37
	Mean ...	...	27·62
Eastern fall	A to L	2,060	34·00
	N to C	1,576	27·62
	O to E	1,350	26·12
	P to G	1,450	27·35
	B to J	1,120	20·12
	Mean ...	...	27·04

Comparative height of Ghorpuri.

7. A reference to the subjoined list of approximate levels will show that Ghorpuri is not so low-lying as some have supposed. The ball court at the south end of the third row of barracks is a convenient point within the lines with which to institute comparisons, and it will be found that the adjoining roadway is only 27 feet below Ganesh Khind, always regarded as so high lying. It is 15 feet lower than the western entrance gate of the Club, but it will be a surprise to many to know that it is 12 feet *above* the mean level of the Kirkee barracks. It is 51 feet above the railway and 82 feet above the river-bank. The patcherries and the roadway opposite No. 12 bangalow are, respectively, 13 and 17 feet lower. Taking the longitudinal and cross sections, shown and described, it must be conceded that the Ghorpuri lines have exceptional natural facilities for drainage.

	Feet.
1. Wanouri pentagon reservoir	272·00 above datum.
2. Top of Khadakvásla dam	255·07 ,,
3. Race stand	244·02 ,,
4. North-west corner of St. Mary's Church enclosure ...	242·43 ,,
5. Government House, Ganesh Khind	238·00 ,,
6. West entrance of Club	216·44 ,,
7. Right flank, N. I. cistern	208·00 ,,
8. Ghorpuri ball court roadway	200·16 ,,
9. Kirkee barracks, mean	188·00 ,,
10. Ghorpuri patcherries	187·00 ,,
11. Roadway at No. 12 bangalow, Ghorpuri ...	182·00 ,,
12. Railway at patcherries	149·00 ,,
13. River-bank	118·00 ,,

The barracks.

8. There are 3 sets of barracks—the old, the second and the new; and with their subsidiary buildings they cover some 29 acres, or 10 acres more than in 1864. They are shown on plates 6, 7 and 8; and it will be seen that whilst the old and the second set belong to a time when in India sanitation was little known, and less thought of, the new leave little to be desired.

Sub-soil sections. See plates.

9. The Superintending Engineer of the Division, Colonel Greig, R.E., has furnished sections showing for the Poona Command the nature of the sub-soil in the vicinity of European barracks at Ghorpuri, Wanouri, Kirkee, Purandhar, Khandála, Sholápur, Devláli, Sátára, Ahmednagar and Málegaon. These stations are all on the trap formation, and practically there is no great difference between any two of them. Until rock is reached at different depths the changes are rung on earth, red soil, and moorum of varying consistency.

Alleged causes of unhealthiness.

10. The Ghorpuri lines have fallen into disfavor by the great prevalence in them of paroxysmal fever, and it is ascribed to various causes. It is said the site is malarious, and there is no getting over the fact that the disease is a specific ague due, or supposed to be due, to a specific miasm. At the same time there is nothing *in the immediate site*—within the flanking nálás, beyond the undefined influence attributed to disintegrating trap, the canal, and the railway—which to my mind stamps it as malarious. In speaking of the newest barracks Dr. Auchinleck points out that they were built on virgin soil, untouched by spade or plough, with scarce a blade of vegetation near; but the Wanouri barracks were built under precisely similar conditions, on a similar formation. Speaking of surface moisture from want of drainage Dr. Fogo says that though there is no water-bearing stratum within 80 feet of the surface, "the uneven conformation of the underground, levelled over with disintegrating trap in some places and black soil in others, receives the monsoon rain, and holds it at various depths until the moisture is returned by evaporation from the surface." This may be so, but there is absolutely nothing to show that the underground formation at Ghorpuri differs from that at Wanouri. There is no practical difference in Colonel Greig's sections: there are no green or damp spots at the surface telling of moisture below: in the old days of well supply it invariably failed before the monsoon: the natural fall of the ground, as well to the flanking nálás as northwards, is such as to ensure exceptionally good drainage: and there is clear and absolute proof that a flooding storm passes off readily and thoroughly in a few hours. When the Committee of 1880 sunk trial-pits in the barrack plinths "no trace of damp was found" at a depth of one foot and a half, and the Committee of 1881, of which I was a member, also sunk pits with more

satisfactory results. Under instructions from the Executive Engineer they were sunk on the 26th September, and taken down to solid rock, and on the following morning we met in the lines to examine them. Now it so happened that on the 26th, at 5 P.M., there was one of those heavy blinding storms which make trickling nálás dangerous torrents, and yet at 8 o'clock the next morning there was no water in the pits. They were, of course, damp but not wet; and though enough rain must have fallen to fill them many times over, none had lodged, nor had it lodged anywhere about the barracks. As a crucial test another pit was sunk whilst we stood there: it was comparatively dry a few inches below the surface, and at less than a foot dust rose under the pick and shovel. With regard to sub-soil drainage nothing is more desirable, but unfortunately it is impracticable at Ghorpuri, except at those places where there is "black cotton soil"—notably in the officers' lines, in front of the married quarters and hospital, and near the nálás: at these places it cannot be too carefully carried out and maintained.

Organic contamination of soil.

11. With a view to ascertain the extent of actual and comparative organic contamination, samples of soil from Ghorpuri, Wanouri and Kirkee were obtained through the Executive Engineer, and forwarded to Dr. Lyon, the Chemical Analyser to Government. The results of his examination are given in his own words, and I merely premise that nothing was elicited to show any essential difference in the soil condition of the 3 places:—

"With reference to your endorsement No. 3767 of the 24th November "last, I have the honor to state that of the samples of moorum forwarded there- "with I submitted 10 to examination, with the results shown in Table No. 1, "attached.

"Bearing in mind the object of the investigation my experiments were "confined to such as would enable an idea to be formed of the amount of organic "contamination of the samples. Indeed the inorganic constituents of the spe- "cimens of moorum forwarded with your No. 3767, as well as those of 18 "further samples forwarded to me at my request in February last by the Execu- "tive Engineer, Poona and Kirkee, appeared to differ but little from one another. "The results of the examination of these 18 further samples are embodied in "Table No. 2, attached.

"Referring now to Table No. 1; column 1 shows the locality from which the "moorum was obtained, and column 2 the depth below the surface at which it "was collected. Columns 3, 4 and 5 show, respectively, the amount of free "ammonia, albuminoid ammonia, and chlorine, yielded by the samples, the "results being stated in milligrammes per 100 grammes or parts per 100,000. "These determinations were effected as follows:—100 grammes of each sample "well powdered was shaken up with 2 litres (2,000 grammes) of distilled water, "and allowed to stand for four days. The clear portion of the liquid was then "drawn off with a siphon and subjected to examination, and the results obtained "calculated for the whole quantity of 100 grammes employed.

"The first point which may be noted with reference to the results embodied "in Table No. 1 is the uniformity of the amount of chlorine yielded by the samples "irrespective of locality and depth. This, it appears to me, is strongly against "any supposition of excessive contamination of the soil with animal excreta.

"Next, I would point out the decrease with depth of the free and albuminoid "ammonia yielded by the samples shown in the 4 specimens of moorum from "No. 3 barrack at Ghorpuri, and in the 2 specimens from No. 21 barrack. "This, I take it, tends to show, as might be expected, a greater amount of organic "contamination (probably, however, from the chlorine results of vegetable origin) "near the surface of the ground than at lower depths.

"In regard, however, to the question whether there was any evidence to show "that the amount of organic contamination of the surface soil was greater at "Ghorpuri than at Wanouri or Kirkee, it appeared to me that the results obtained "were insufficient to enable any opinion to be arrived at on this point. I, there- "fore, requested the Executive Engineer to forward me 6 samples from each "of the localities named, each sample to be taken at a depth of 3 inches from "the surface, 3 to be taken from the immediate neighbourhood of 3 different "barracks, and 3 from a distance of 100 feet from the same barracks. The "results obtained from the examination of these 18 samples are embodied in "Table No. 2.

"The examination of these 18 samples for free and albuminoid ammonia "was conducted in the same way as that adopted in the case of the previous "10 samples; the results obtained are also stated in the same way, *viz.*, in parts "per 100,000. In addition to determination of the free and albuminoid am- "monia, the loss on drying at 212° F. experienced by each sample was ascertained "so as to obtain an approximation to the amount of moisture present. The "additional loss experienced by each dried sample on incineration, after restora- "tion of the carbonic acid lost, was also determined, so that an approximation to "the total amount of organic matter present might be arrived at. The results "of these last two determinations are expressed in Table No. 2 as percentages.

"The general result of the examination of these 18 samples was, you will "observe, entirely negative, and showed no evidence of any greater amount of "organic contamination of the surface soil at Ghorpuri than of the surface soil "at Wanouri or Kirkee. Indeed, if any thing, the results tend to indicate that "of the 3 localities it is at Kirkee that the greatest amount of moisture is present "in the surface soil, and probably also the greatest amount of organic matter.

"*Table No. 1.—Results of the examination of* 10 *samples of moorum forwarded* "*with Sanitary Commissioner's endorsement No.* 3767 *of the* 24*th November* "1881.

	Depth below surface.	Milligrammes per 100 Grammes, i.e. Parts per 100,000.		
		Free Ammonia.	Albuminoid Ammonia.	Chlorine.
Ghorpuri, No. 3 barrack	0	·21	·30	12·0
Do. do.	4½ feet.	·05	·10	12·0
Do. do.	6½ „	·05	·14	8·0
Do. do.	8½ „	·03	·14	12·0
Do. No. 21 do.	1 foot.	·24	·28	16·0
Do. do.	3 feet.	·00	·14	12·0
Wanouri, No. 6 do.	1 foot.	·08	·12	8·0
Do. No. 11 do.	1 „	·16	·16	12·0
Kirkee, No. 10 do.	2 feet.	·18	·16	12·0
Do. do.	2½ „	·21	·16	8·0

"*Table No. 2.—Results of the examination of* 18 *samples of moorum forwarded* "*by the Executive Engineer, Poona and Kirkee, with letter No.* 637 *of the* "*4th February* 1882.

	Number of Barrack.	Close to Plinth of Barrack.				100 feet away from Plinth of Barrack.			
		Ammonia results in Milligrammes per 100 Grammes, i. e., parts per 100,000 of earth.		Loss on drying and further loss on incineration after restoring carbonic acid per cent.		Ammonia results in Milligrammes per 100 Grammes i. e., parts per 100,000 of earth.		Loss on drying and further loss on incineration after restoring carbonic acid per cent.	
		Free.	Albuminoid.	After drying.	After incineration	Free.	Albuminoid.	After drying.	After incineration.
Kirkee	2nd Royal Artillery, new set ...	·05	·30	5·57	7·50	·37	·26	5·75	7·57
Do.	11 Royal Artillery, old set ...	·32	·22	5·75	5·35	·16	·22	5·88	7·03
Do.	7th Royal Artillery, new set	·37	·18	5·78	7·29	·21	·16	8·01	9·44
Wanouri	No. 1	·32	·36	4·46	5·15	·25	·32	6·45	7·86
Do.	No. 9	·16	·12	4·02	3·87	·05	·14	4·22	5·28
Do.	No. 16	·08	·36	4·13	2·53	·11	·16	4·32	2·58
Ghorpuri	No. 2, new set ...	·25	·32	4·88	4·93	·21	·18	3·72	2·53
Do.	No. 7, 2nd set ...	·21	·16	6·20	6·08	·25	·18	6·32	7·15
Do.	No. 13, old set ...	·21	·36	5·12	5·03	·37	·48	4·89	5·36

12. It has been said that another source of malaria is the soakage from lavatories and kitchens, and from sepoys' huts in the Native Infantry lines. For the Ghorpuri lines the supply is from the Khadakvásla Canal. It is delivered at the barracks by gravitation, and is of good quality: that for drinking is filtered, though the general supply is not. The consumption is given in the subjoined table, and it will be seen that for 4 years the daily rate has been 12,354 gallons. It may be said that for 8 months of the year none of the water delivered in the lines leaves them by drainage; but such is the general aridity that not only are soil and sub-soil free from damp, but for months together they are burnt up, baked and parched. The waste from kitchens is led to iron receptacles, whilst that from lavatories goes to cesspools, and both cesspools and receptacles are emptied by hand at short intervals, the contents being carried away. It is, at best, a clumsy method, and if pipe drains cannot be provided, it would be preferable to run the waste on to beds properly prepared, and rake it in. Pipe drains would, of course, be best in every way, and if they were properly laid, and looked after, there would be no danger whatever.

Water-supply and soakage of waste.

See Annual Report for 1879, Section VI, para. 51.

Statement showing the quantities of water delivered to the Ghorpuri Barracks in the years shown.

	1878.	1879.	1880.	1881.
	Gallons.	Gallons.	Gallons.	Gallons.
January	.....	428,140	369,490	415,260
February	.....	147,240	257,010	405,660
March	.....	340,670	480,190	525,940
April	1,245,550	451,080	570,990	624,400
May	1,034,730	436,060	581,640	617,450
June	552,290	275,770	316,400	508,070
July	705,600	409,970	247,130	510,850
August	172,440	208,750	251,280	.....
September	509,410	405,690	262,370	.....
October	393,680	337,010	429,400	.....
November	333,450	366,790	347,340	.....
December	231,620	337,420	356,840	.....
Total ...	5,178,770	4,144,590	4,470,080	3,607,630
Average daily rate per year ...	18,832	11,355	12,213	17,017

Average daily rate = 12,354 gallons for 4 years.

13. For the Native Infantry lines the supply is also by gravitation from the Khadakvásla Canal, and the quantities are subjoined. The daily rate is 17,351 gallons per regiment, or some 5,000 gallons more than for Ghorpuri. Here, again, there is no regular drainage, but then the delivery is not actually within the lines. The fall from the lines to the cisterns is some 30 feet, and the latter are near the sharp slope of the western nála. There are gardens, too, expressly made to utilize the waste; and, as a matter of fact, the main consumption is at the cisterns: whatever is used within the lines is carried there, and it is very doubtful if under these circumstances the quantity averages 2 gallons per head per diem. If, however, the dampness of the sub-soil in these lines is a source of malaria, the effects should show themselves within the lines rather than at Ghorpuri; but the sepoys have not suffered.

Statement showing in gallons the consumption of water in the Native Infantry Lines during 1879-80 *and* 1880-81 *up to and for August.*

Month.	Right Flank Native Infantry Lines.	Center Native Infantry Lines.	Left Flank Native Infantry Lines.	
April 1879	800,830	400,710	823,750	502,193 + 377,473 + 681,972 = 1,561,638 ÷ 90 = 53,068·6 per day.
May ,, ...	543,210	326,050	655,680	
June ,, ...	367,710	197,700	542,820	
July ,, ...	692,670	286,920	591,380	
August ,, ...	513,480	248,880	643,790	
September ,, ...	578,200	355,870	667,780	
October ,, ...	561,130	350,670	678,270	
November ,, ...	597,670	383,950	801,340	
December ,, ...	668,900	433,300	547,560	
January 1880	495,550	451,610	426,430	
February ,, ...	294,950	194,760	290,100	
March ,, ...	538,410	365,100	411,650	
April ,, ...	627,000	497,000	768,000	
May ,, ...	587,610	475,860	767,400	
June ,, ...	544,650	408,390	713,530	
July ,, ...	554,310	338,500	694,630	
August ,, ...	636,860	426,270	787,000	
September ,, ...	247,060	289,680	793,010	
October ,, ...	379,360	430,540	902,400	
November ,, ...	642,930	455,840	889,850	
December ,, ...	486,640	359,790	824,330	
January 1881	267,280	390,370	752,810	
February ,, ...	215,140	363,180	714,690	
March ,, ...	308,520	444,080	682,130	
April ,, ...	485,920	432,790	672,830	
May ,, ...	419,050	542,700	695,570	
June ,, ...	474,750	542,700	647,120	
July ,, ...	559,220	290,232	634,530	
August ,, ...	474,590	263,280	756,810	
Total ...	14,563,600	10,946,722	19,777,190	
Means ...	502,193	377,473	681,972	

14. It has been said that the wet irrigation cultivation is a source of malaria, and that with an extension of its area there has been a corresponding increase in the number of fever cases. This area is shaded green in the map of the Poona Cantonment, and there are also shown the wells which existed before the canal was made, and which are still in use. On the east the cultivation extends for many miles, and is extending: on the west it borders the canal from Parvati to the cemetery, and stretches northwards between the city and the cantonment bázár as far as the Kirkee road, where it is met by similar cultivation from the Pashan Canal. The relative positions are these: to the extreme west is the city, where close on 100,000 people live under the most insanitary conditions: then comes the interposed wet cultivation: then the bázár much like the city in its sanitation: beyond the bázár are rows of private bangalows: then come the slopes of the western nála, then the nála itself, then the Native Infantry lines, and on the extreme east the Ghorpuri lines. The wind chart on the map will show how these several positions stand in relation to the wet cultivation. It will be seen that whilst on the east it is bounded by the eastern nála, on the west it actually marches with the western limit of the bázár and the eastern boundary of the city. It extends to the river on the north and north-west of Kirkee, and, speaking generally, it encircles the Cantonment, except on the north, north-west and south, and occupies every place to which water will gravitate. A return* furnished by the Collector gives the extent of land around the Cantonment under dry and wet cultivation, and the wet is divided into that irrigated

Irrigation and cultivation.

*Appended.

by wells and by the canal. The subjoined summary will show that the canal irrigation has largley supplemented that from wells, but has not superseded it:—

By wells.		By the Canal.
280	acres on S. W.	289
1,265	,, W.	1,940
476	,, N. E and E.	1,337
1,485	,, S.	28
3,506		3,594
		3,506
		88

The following represents the dry cultivation, but it is not urged that this has any injurious influence:—

8,752	acres on S. W.
44,638	,, W.
2,788	,, N. E. and E.
7,869	,, S.
64,047	

The wet crops are chiefly sugarcane, and not only must the fields be flooded, but they must also be heavily manured. This manuring is effected with the poudrette made at the Poona City nightsoil depôt, and although the cultivators are keenly alive to their own interests, and after their lights are thoroughly versed in agriculture, it is very possible that both the flooding and the manuring might be better managed. There is no where any attempt at sub-soil drainage: the poudrette is thrown broadcast over the fields, and they are then flooded. Every shift of wind in the western half of the circle must come from the wet cultivation to the bázár and the lines beyond, and similarly from the eastern half it comes into the Ghorpuri lines and the bázár and the city. In Upper Italy irrigation flooding, without adequate drainage, was there supposed to have given rise to malaria; but in Poona the soil for months together is so thirsty, that it quickly absorbs all the water that the cultivators give it. It cannot be that malaria is generated on the west and south-west, is then blown scathless over the bázár, the bangalows and the Native Infantry lines, and impinges on Ghorpuri. If the wet cultivation in this quarter is a factor, the effects must be felt in occupied areas nearer to it than Ghorpuri, and the city and bázár registers should show it. These, however, are not sufficiently reliable, and no use can be made of them. As regards the cultivation beyond the eastern nála, it is, for Ghorpuri, of far greater significance. The air of occupied areas is warmer than that of cultivated ground adjacent, and as it ascends there is a proportionate intake from outside to replace it. In this way a sure, though imperceptible, intake is established from beyond the eastern nála into the barrack area, and its influence is greatest at those hours when the system is least able to withstand it.

Condition of Bázár and City.

15. On the west the bázár and the city are powerful factors, not necessarily from their windward position, but because of their insanitary condition. Each has its system of surface conservancy and the organization*

Extent of sickness.

16. The Surgeon General, Her Majesty's Forces, furnished the Committee of 1880 with a return showing for Ghorpuri and Wanouri the comparative ratios of admission per 1,000 of strength from 1869 to 1870 inclusive. It is subjoined, and a column is added showing, for paroxysmal fever, the proportion between the two places. The mean for the 11 years shows that, Wanouri being 1, Ghorpuri is 2·01.

* The manuscript of the remaining portion of this para. was found after Mr. Lamsdaine's departure to be missing.—T. G. H.

Years.	Wanowri. Corps.	Wanowri. The ratio of admissions from Paroxysmal Fevers per 1,000 of strength.	Ghorpuri. Corps.	Ghorpuri. The ratio of admissions from Paroxysmal Fevers per 1,000 of strength	Proportion — Wanowri being 1 Ghorpuri is
1869	59th Foot from Ceylon on 23rd March ; 90th Foot from 1st to 14th January.	98·29	1-2nd Queen's	160·97	1·63
1870	59th Foot to March, 23rd Foot from England on the 30th April, Detachment 90th from 11th June to 31st September.	51·81	1-2nd Queen's, Detachment 90th Foot from 27th March to 10th June.	174·42	3·36
1871	59th Foot 8th December, 83rd whole year.	220·97	56th Foot from England on 8th April.	456·93	1·19
1872	59th Foot from England on 14th March, 83rd Foot from 1st January to 19th February.	132·18	56th Foot	329·07	2·49
1873	59th Foot from 1st January to 23rd December, 83rd Foot from 1st January to 3rd December.	329·89	56th Foot to 4th December, 2-7th Foot from England on 2nd November.	241·73	0·73
1874	59th Foot from 1st January to 7th and 30th November.	253·60	2-7th Foot	491·80	2·05
1875	2/15th Foot from England on 18th March.	419·00	2-7th Foot	1,205·27	2·88
1876	2-15th Foot from 1st January to 9th December.	437·59	66th Foot from 22nd February to 19th November.	764·00	1·67
1877	2-15th Foot from England on the 13th March.	731·83	1-2nd Foot	674·96	0·93
1878	2-11th Foot	369·62	1-2nd Foot from 1st January to 19th November, leaving Depôt behind.	688·43	1·73
1879	78th Highlanders from England on the 29th March.	551·07	2-11th Foot from February to 31st December.	2,119·16	3·69
Mean for 11 years .	....	324·95	....	622·09	2·01

17. The above return must be read with the subjoined, which shows the composition of the regiments for those years when the sickness in the lines was causing grave anxiety. The first four lines give a total of 3,362 men, of whom 1,135, or 33 per cent., were under 6 years' service.

Regiments quartered at Ghorpuri.

Period.	Regiment.	Unlimited Service.	Long Service. 1st Period. (Under 12 years.)	Long Service. 2nd Period. (Over 12 years.)	Short Service. (Under 6 years).	Total.
1874-75	2-7th Foot (1st January 1875).	.....	308	279	310	897
1876	66th Foot (1st October 1876).	.....	362	393	117	872
1877-78	1-2nd Foot (1st June 1878).	2	188	441	82	713
1879-80	2-11th Foot (1st February 1880).	.....	128	126	626	880

			18 years and upwards.	6 and under 18.	5 and under 6.	4 and under 5.	3 and under 4.	2 and under 3.	1 and under 2.	Under 1 year.	Total.
New return lately introduced.	1880 ...	78th Highlanders (1st July 1880).	24	172	34	107	187	264	118	3	909
	1880-81 ...	Rifle Brigade (1st January 1881).	25	130	46	113	136	230	157	27	864

18. In the 2/7th there were 34 per cent., and the ratio of admissions per 1,000 of strength was 1,205: in the 66th with 13 per cent. it was 764: in the 1/2nd with 11 per cent. the mean is 655, and in the 2/11th with 71 per cent. it was 2,118. In the 78th Highlanders the percentage was 78, and in the 1st Battalion Rifle Brigade it was 82. I have no returns at hand to show what were their ratios, but they were heavy, and in the Rifle Battalion so heavy as to lead to abandonment of the lines. In a letter* to Government regarding malarious fever at Bhúj the Surgeon General, Her Majesty's Forces, says: "It may be that the sudden chill affecting a person previously exposed to long continued heat, in itself, produces the peculiar symptoms we call malarial fever: or that the chill

*No. 298s dated April 8th, 1882.

may act in another way by causing the appearance of the symptoms in a person whose system is already charged with the so-called malarial poison." Whatever the causes there was one which in this particular case had great influence. In matters of sickness the men generally are strangely fanciful and impressionable; and if once they get hold of the idea that a place is unhealthy, the chances are that to them it will prove unhealthy. Now, when the 2nd Queen's were suffering at Ghorpuri, the 2/11th were at Wanohri, and it is very certain that the sickness in the one regiment was freely commented on by the men of the other. When, therefore, the 2/11th moved to Ghorpuri they went to the lines with the conviction that they were bad, and they were prepared, as it were, to be ill. When they were at their worst the 78th Highlanders were watching them from Wanouri: so, when they in their turn followed the 2/11th, it is not surprising that they sickened. The next regiment was the 1st Battalion Rifle Brigade fresh from England; and I believe I am correct in saying that the then Commander-in-Chief told them how preceeding regiments had suffered, and that they were to go there to see if they would be affected. The men are, I think, recruited in London, and in a strength of 864 there were 709 under 6 years' service: they were of poor physique, and they suffered most of all. Since the Rifle Battalion vacated the lines they have been occupied at intervals by details, and by Native troops, but these have not suffered.

19. The following recommendations were attached to the Committee proceedings in 1881. They were not made under the idea that the measures suggested would especially influence the specific miasm which is the accredited *exciting* cause of malarial fever, but they commend themselves for adoption generally; and as they would improve the local conditions, they would in this way tend to modify the predisposing causes. I venture to think that, if these be lessened, the exciting cause would be less active.

Recommendations.

20. The drainage lines laid down by Colonel Finch, R.E., to be supplemented where the Executive Engineer thinks it necessary, and to connect with the eastern and western nálás—to be dry pitched where carried through loose soil, and all to be kept in *thorough* order.

Storm water drainage.

21. The deep sub-soil drains in the officers' lines to be similarly conserved and supplemented when and where necessary.

Sub-soil drainage.

22. All practicable means to be taken to promote the flow in flanking nálás, and the course of the western nálá to be straightened where it passes through loose soil, and dry pitched if necessary.

The flanking nálás.

23. In the main these suggestions have already been made by the Committees of 1876 and 1880; but they were not carried out thoroughly, and in matters of drainage no half measures can be expected to answer.

24. All buildings to have, in addition to through ventilation, such ventilation as will provide for the free escape of air above the level of doors and windows. I say *all* buildings, because I think an open shed should have an exit for the air held under its roof.

Barracks and subsidiary buildings.

25. The plinths of all occupied buildings to be dug out their full depth: six inches of concrete to be laid down and covered with dammer; over the dammer very careful dry hand-packing, then another 6 inches of concrete, and then the stone or asphalte flooring. General Fuller, R.E., built his house on a portion of the Bombay Flats which for months together is literally an undrained swamp. He built his plinths in this way—without the dammer—and his house has no trace of dampness. For barracks to be built, the raised basements of the Army Sanitary Commission are infinitely preferable, but for existing buildings the alteration is feasible. Plinths which are not in themselves high enough to be so treated, might have a layer of concrete and dammer under the impervious flooring.

Plinths.

26. The ground round about all plinths to be well rammed, and so pitched that rainfall may pass off easily. If this be done properly there is no *absolute* necessity for eaves gutters.

Doors.

27. Doors to be raised to 10 feet in height, and to be in two parts: the lower 7 feet to be like those now fitted, substituting wire gauze for louvres in the lower panels. The upper 3 feet to be hinged on lower edge, to open inwards from 12 to 18 inches, with side checks of fine wire gauze. These are the doors of the Army Sanitary Commission. Doors of subsidiary occupied buildings to be raised in proportion to the height of the walls, and to be similarly treated.

Clerestory windows.

28. Clerestory windows to be similarly hinged and provided with side checks. In buildings, where they are not admissible, circular openings to be made in the walls high up under the eaves: these openings to be about 6 inches diameter, to slope inwards and upwards, to be screened at both ends, and to be at such intervals as the construction will admit.

Drainage scheme.

29. A drainage system to be prepared by the Executive Engineer to meet following requirements. The drip from all taps, the waste from all lavatories and bath-rooms, from all privies and urinaries, and the fluid waste from all kitchens to be carried by pipe drains to a selected site beyond the railway, and there utilized. No pipe drain to enter a building, every drain to be trapped, and the main line to have an air chamber at every 50 yards. This is not the first time that a regular drainage system has been suggested, but objection has been taken to it on the score of expense, on the ground that it would not touch the real cause of the prevalent fever, and because it might become a source of typhoid fever. As regards expense, the cost would, of course, be great; but the charge for sweepers and filth carts is now a heavy one—and reckoning it up since the barracks were first occupied the cost would far exceed that of a drainage scheme, and it is a perpetually recurring cost. When the barracks were occupied, the annual charge was Rs. 5,340; but some of it was for surface cleansing, and that would be necessary even with a drainage scheme. The sale of the sweepings, however, would more than cover it, and the gain in other respects would be immense. It may be urged, that a contractor would willingly remove sweepings and nightsoil, *and pay for doing so*, if permitted to do as he liked with them. He would, but with a local sewage farm the lines would be infinitely cleaner than if traversed by sweepers and nightsoil carts.

30. As regards the ground that it would not touch the real cause of the fever, it is not contended that it would; but by improving the local conditions it would probably, and presumably lessen the predisposing causes.

31. As to its being a probable cause of typhoid it is not too much to say that with a well-devised and well-executed scheme the chances would be about the same as the chances of a boiler explosion on a railway journey. The true principles of drainage are very simple, and at Ghorpuri the carrying them out would be made easier by the fact of the buildings to be drained being detached.

Water-supply.

32. The water-supply should be from the high-level pentagon reservoir which contains filtered water. If it be necessary to employ bhistis, even for short distances, it should be a standing rule that mussocks be regularly washed out and inspected.

Tree planting.

33. Tree planting has been recommended by the Committees of 1876 and 1880, and it has been carried out very considerably, but there is yet room for its extension. If sites could be found for the officers' bangalows the whole of that area might be thickly planted for several feet along the course of the eastern nála. A deep belt of trees here would minimize the ill effects of the wet cultivation beyond the nála.

34. Cultivation is of equal importance, and there are numerous spots well suited for it along the course of both flanking nálas. On the east more especially it might advantageously cover almost all the ground where the bangalows stand. Broken ground should everywhere be filled in and levelled.

Sanitary Police.

35. The regiment in occupation should have selected men to look after every detail connected with the conservancy of the lines. Their inspection should be regular and thorough, and they should at once report any neglect or want of repairs in arrangements and appliances. There can be no doubt that in some regiments more attention is paid to details of barrack occupation and to personal hygiene; and it is very certain that in proportion to this attention will be the healthiness of tone and the well-being of the men.

Rations.

36. As regards rations there are different opinions as to whether the men have much in the shape of a meal after their dinners: but all will agree as to the expediency of their having good cocoa and bread, or biscuit, as they have in the Navy, before their early parades. Dr. McCreery's practical remarks on this point are deserving of attention.

Statement showing the Amount of Cultivation, Wet and Dry, on the confines of the Poona Cantonment before and after the opening of the Khadakvásla Canal.

Year.	South-west.			West.			North-east and East.			South.			Remarks.
	Parvati (a).			Máli, Mungeri, and Poona City (b).			Ghorpuri (c).			Wanouri (d).			
	Dry.	Wet.	Mutha Canal.	Dry.	Wet.	Mutha Canal.	Dry.	Wet.	Mutha Canal.	Dry.	Wet.	Mutha Canal.	
	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	Acres.	
1866-67	774	56	...	2,933	253	...	...	...	...	722	128	...	(a) Figures for the years 1872-73 to 1875-76 are not available, owing to the destruction of records by fire in the Budhwár Wáda.
1867-68	774	56	...	2,952	253	...	...	...	...	722	128	...	
1868-69	774	56	...	2,952	253	...	...	...	...	722	128	...	
1869-70	774	56	...	2,935	253	...	...	...	...	727	128	...	
1870-71	774	56	...	3,146	253	...	...	...	...	690	128	...	
1871-72	831	...	...	3,188	...	...	...	...	...	690	128	...	(b) Figures under the head "Dry" do not include figures for the Poona City for the years 1866-67 to 1877-78, and as regards Máli for the years 1872-73 to 1877-78, the same not being available.
1872-73	...	...	...	2,739	...	...	...	...	...	...	...	...	
1873-74	...	...	...	2,736	...	44	...	...	...	...	...	...	
1874-75	...	...	...	2,734	...	38	...	...	...	...	...	...	
1875-76	...	...	...	2,734	...	330	...	...	92	...	...	4	
1876-77	790	...	53	2,734	...	242	...	...	199	720	144	7	
1877-78	817	...	39	3,174	...	271	699	119	320	720	144	5	
1878-79	814	...	39	3,216	...	284	699	119	206	719	144	Gunthas. 23 Acres. 7	(c) Figures for the years 1866-67 to 1876-77 are not available.
1879-80	814	...	55	3,231	...	314	699	119	265	719	144		(d) Figures for the years 1872-73 to 1875-76 are not available.
1880-81	816	...	103	3,234	...	420	691	119	257	718	141	5	

Note I.—The area under wet cultivation for Parvati, Máli, Mungeri, and Poona City is not separately ascertainable from the year 1871-72; that under "Dry" cultivation, therefore, represents the entire area cultivated in these villages.

The area irrigated by the canal is given separately under the head "Canal", but it is not included in the previous columns "Dry" and "Wet".

Note II.—There has been no irrigation under the canal to the north and north-west of the Cantonment.

DRAINAGE FOR POONA CITY.

37. In last year's Report—Section VI, pages 17–31—there is a description of Colonel Ducat's Drainage Scheme for the City of Poona; and though his proposals were endorsed by so high an authority as Mr. Rawlinson, the local distrust is such that nothing has yet been done. The subject again came up in connection with a Report by the Municipal Secretary on the Working of the City Nightsoil Depôt, and I then addressed the following letter to Government:—

"2. In noticing the Report by the Municipal Secretary I must premise, that I am myself an advocate of the dry-earth system of conservancy, but only under certain conditions; and for places where those conditions obtain, its extension has been urged on every possible occasion. The development of the Poona Depôt has been watched year by year, and most willing testimony has been given as to the admirable way in which it has been worked: in fact it is not too much to say, that the working now is as good as it can be under the circumstances, and the success attained is largely due to the personal efforts and influence of the Secretary. I say this now lest what I am now about to say should be considered as in any way reflecting upon him or his work.

"3. *For places where the absence of a water-supply renders a water carriage sewerage scheme impracticable*, the Poona system offers a ready mode of dealing with the refuse collected, and that, too, without expensive plant, or appliances; but, apart from the loathsomeness and degradation it entails, it can never be really and thoroughly efficient, nor can it be worked at a profit, as the Report itself will show. Its radical defect is that it fails to touch [the *liquid* refuse. Removing only the dry refuse, with *a mere fraction* of the excreta, and this at uncertain intervals, it cannot compete with a system which not only provides for the *instant* removal of *all* excreta and *liquid* refuse, but, saving the recurring cost of a halálkhor service and haulage, leaves the *dry* refuse for sale as manure.

"4. In the practical cleansing of towns the refuse to be removed is made up of

1 House and street sweepings—dry refuse,

2 House and street sullage—liquid refuse, including manufacture and trade waste,

3 Excreta,

and obviously the more that is removed the more efficient is the conservancy, whilst the more speedily it is done the better is it for the public health. In dealing with house and street sweepings there is no fixed standard by which to gauge the amount that should be removed, so it can only be done by comparing the actuals with those of other places similarly served. In the City, with its 99,421 inhabitants, the daily collection is 86 cart-loads: in the Cantonment, with 19,273 persons, it is 72 cart-loads. If the scavengering in the City was equal to that in the Cantonment, the outcome would be 371 cart-loads instead of 86.

"5. In dealing with the nightsoil there is an estimated standard, and it is given as 2·5 ounces of fæces, and 40 ounces of urine per head per day. To this, however, there must be added 8 ounces of ablution water which the Secretary says cannot be separated, so the total per head per day is 50 ounces. The estimates are those of the highest authorities, and accepting them as approximately correct, the amount of fæcal matter for 99,421 persons is 140 tons per diem: the amount removed is 14 tons, or *one-tenth*. In the Cantonment the estimated amount for 19,273 persons is 27·16 tons per day, and the amount removed is 7·6 tons, nearly *one-fourth*, so both in its scavengering and its halálkhor service the results for the Cantonment are better than those for the City.

"6. What would benefit the one place would equally benefit the other, and with a water carriage sewerage scheme the greater portion of the 140 tons of fæcal matter would be removed from the City; indeed practically it all would, and in addition there would be carried off all the water delivered, and drawn, but not consumed. At present some of this water finds its way into the river, and as liquid refuse it converts the stream above the old city bridge into a pool of the foulest sewage; the greater portion, however, is absorbed before it reaches the river, and adds very considerably to the generally polluted condition of the soil and sub-soil. Under a sewerage scheme all would eventually be changed. The filthy discharges from bath-rooms and kitchens, and the still filthier ooze from privies, would no longer lie about to taint the air, and endanger the water-supply; and the enforced supply of public latrines and urinals would in time suppress those every-day practices which are as degrading as they are disgusting.

"7. I now take the question of economy. Many years ago an exhaustive inquiry by a Parliamentary Committee established the fact, that 'one ton of average town sewage contains an amount of manure which, if extracted and dried, would be worth a little over two-pence, taking Peruvian guano at £11 as the standard.' They added: 'we have no reliable evidence that the solids extracted, and made into a portable manure, have any paying commercial value,' and in support of this statement they quoted the condition at Birmingham, Leeds, Bradford, Bolton, and Coventry, where no sale could be found for thousands upon thousands of tons of sewage sludge. They said: 'at Halifax and Rochdale, where the pail system is in operation, and the excreta are collected by hand, and mixed with

house ashes, there are thousands of tons of the prepared manure in store, because a ready sale for it cannot be effected.' Now the works at Halifax and Rochdale are very similar to those at Poona. In those towns the nightsoil and house ashes are mixed in the ratio of 80 to 35, but the ash is chiefly from coal, not the more valuable vegetable ash of Poona. At Amsterdam, under Lieurner's pneumatic system, the fresh excreta were delivered straight from the closet, and on this the Committee say: 'at present farmers have tried the manure, and have paid at a rate of 8 pence per 32 gallons, or 6*s.* 8*d.* per ton, but this price was soon abandoned, and reduced to two-pence per 32 gallons, or 1*s.* 8*d.* per ton. Ultimately, after further trial, this arrangement ceased.' This last price (about 14 annas per ton) could not be maintained in Holland, where very high farming is practised, and the Secretary says, that at Poona, when the nightsoil was mixed with earth instead of ashes, it was no longer sought after by the cultivators, and was only disposed of with difficulty. It has been satisfactorily proved that neither the solids extracted from sewage, nor excreta straight from the closet, have in themselves the essentials for a remunerative manure: their composition is wanting in certain constituents, and it is not until those constituents are added that their manurial value is so enhanced. At Poona they are added, and the combined product has a ready sale, so much so that the demand far exceeds the supply; but I think it may be shown from the Report that the cost of production is a heavy charge upon municipal expenditure and that better results may be obtained from a different procedure. In quoting from the Report of the Parliamentary Committee, I have not overlooked Dr. Voelcker's observations to the effect that it is not fair to make a comparison between the money value of the 'dry constituents of sewage and of guano, without allowing a very considerable deduction for the useless matter'; and that 'the more bulky a manure is the less manageable it is, and the less is its practical value'; also that 'we cannot calculate the value of any fertilizer by the price of the constituents we put in the land; we ought to calculate the value by what we can get out through the instrumentality of certain manures, and following this plan it will be found that the real fertilizing value of the sewage of towns will not perhaps on the average be more than a *half-penny per ton*.' These remarks have their force in England where high class farming is carried on under the absolute necessity of sub-soil drainage more or less deep and costly; but in this country, where for the greater part of the year the land cries out for water, there is little to fear on the score of there being too much sewage.

"8. The Municipal Secretary gives the cost connected with the depôt as Rs. 19,684, but he says nothing of the incidental cost of collection. In the Municipal Budget for 1881-82, the cost of the city scavengering and halálkhor establishments is shown as Rs. 35,256: for the depôt itself it is Rs. 3,372, for haulage Rs. 13,200, and Rs. 10,929 cover the supervision, plant, and contingencies. Now without this expenditure the materials could not be collected and taken to the depôt, there to be made into poudrette; so obviously the cost of collection is as much a charge against the manufacture as is that for carting, or mixing, or any other item, and the real total is Rs. 62,757, not 19,684. As the sum realized by the sale of the poudrette is Rs. 30,776, the debit balance is Rs. 31,981. The Report explains how every day 43 tons of sweepings are reduced by burning to 5½ tons, and how these 5½ tons are then mixed with 14 tons of fæcal matter. As the daily manufacture is 16 tons, the loss in drying must be 3¼ tons, and the poudrette must be made up of 5½ tons of ash and 10¾ tons of fæcal matter. Now 10¾ tons per day mean 3,894 tons per year, and, at 14 annas per ton, the money value is Rs. 3,399. This represents the value of the fæcal constituents, but as the poudrette brings in Rs. 30,776, the following will be the comparative values:—

See Appendix A.

Rs.	3,399	value of fæcal constituents.
„	27,377	„ ash „
Rs.	30,776	„ poudrette.

"9. Under a water carriage sewerage scheme the depôt would, of course, disappear, but the whole of the cost connected with it would be saved, and this alone is Rs. 44,833. Instead of a mere fraction the greater portion of the fæcal matter would be removed, and with it would go the water polluted by use. There would then remain the sweepings, and even as ash their value has been shown. If, however, instead of being burnt they were treated in the way suggested, by agricultural chemists for compost and farm-yard manure, their value would be immensely increased; and as manure the resulting product would still be available for cultivators. If the plan suggested by Colonel Ducat was carried out it would ensure for them a high money value, and as ready a sale as the poudrette now has. Picked out from the Municipal Budget, the cost connected with scavengering is Rs. 19,399. With the imperfect scavengering now carried on there are 31,390 cart-loads per year, but if it were brought to the Cantonment standard there would be 133,715. The selling price of the poudrette is from Rs. 2 to Rs. 4 per cubic yard, and if the supply ceased, there would necessarily be a demand for the sweepings. Now a cart-load contains 30 cubic feet, and giving them for the price of 1 cubic yard of poudrette, the results would be—

See Appendix A.

133,715	loads at Rs.	2	= 2,67,430.
„	„	3	= 4,01,145.
„	„	4	= 5,34,860.

"The entire cost of collection, plant, contingencies and haulage might be saved by adopting the Cantonment procedure, and selling the refuse removal contract by public auction. The individual interest of the contractor will be far keener than the interests of a collective body delegated to paid subordinates, and the incentive that now gets 72 cart-loads from 19,273 persons would soon secure a proportionate amount from 99,421 persons. There is a table in the Report giving the annual out-turn of poudrette, and the value realized. I have here reproduced it, and have added two columns to show the relative ratios of quantities to prices :—

Years.	Quantity of Manure turned out in cubic yards.	Value realized in Rupees.	Proportion between quantities made and value realized.	
			Quantity.	Value.
		Rs.		Rs.
1874-75	2,220	766	1	1
1875-76	3,350	1,308	1·51	1·71
1876-77	4,460	2,632	2·01	3·44
1877-78	5,550	2,840	2·50	3·71
1878-79	8,150	4,356	3·67	5·69
1879-80	9,200	8,956	4·14	11·70
1880-81	10,350	11,707	4·66	15·29
1881-82	11,760	30,766	5·30	40·18

"The above table needs little comment. It shows that the necessities of the cultivators have been the opportunity of the Municipality, and such has been the need for manure that whilst the amount produced has only increased some five-fold, the amount realized is almost 40 times that first obtained.

"10. In the 4th para. of the Collector's memorandum he speaks of 'a clear profit of Rs. 11,092,' and he gets it by deducting from the sum realized by the sale of poudrette the cost of manufacture as shown by the Secretary. In stating the cost of a building would any one omit the price of materials with which it was built, and merely give the cost of putting those materials together? Surely not, and yet this is what has been done with the poudrette. The cost of the manufactured product is given, but the cost of the constituent materials has been overlooked or ignored.

"11. In the 2nd para. of the Commissioner's memorandum he advances views so directly at variance with those of our greatest authorities, and, if I may say it, so opposed to all progress, that I cannot but think they are put forward under a misconception of the subject. He says that 'in any drainage scheme it would be most unwise both in the financial interests of the Municipality, and in the interests of the cultivators around Poona, to provide for the removal of anything but the rain water, and the sullage water from houses.' Now, with all deference, neither Colonel Ducat's, nor any scheme on the same principles, makes, or would make, any provision for the removal of anything but 'the sullage water from houses' *and streets*. The distinctive feature of these schemes is that the sewage and the rainfall are separated : the latter is assisted into its natural channels, and at Poona there are special facilities for passing it to its natural outlet—the river. Nor is there any *special* provision for the nightsoil. In taking out the capacities for the sewers the nightsoil is not a factor, and whether it be admitted or excluded, there would be no difference in the size of one single pipe, nor would there be any appreciable difference in the sewage at the outfall. It goes with the liquid refuse because it is such an insignificant fraction of the whole, and because it is the best and readiest way of getting rid of it. Mr. Robertson's second proposition is that for all 'other matters the dry-earth system is not only by far the best, but it is exceedingly profitable to the Municipality, and a great boon to the people who have irrigated land around Poona.' Can that system be 'by far the best' which leaves every day upwards of 100 tons of nightsoil to pollute the banks of the intersecting streams, to lie broadcast here, there, and every where, or form sickening pools of fætid ooze in side lanes and gutters? And can it be 'exceedingly profitable' when the expenditure on poudrette manufacture exceeds the receipts by no less a sum than Rs. 31,981? As regards the great boon to the cultivators *around* Poona, let it not be forgotten, that there are close upon 100,000 persons, *within* Poona, to whom the improved drainage and sanitation of the city would be a greater boon. It cannot be that the interests of the many within the city are to be subservient to the interests of the few outside. But would these cultivators suffer? The dry refuse would still be available, and in four-fold quantity with more efficient scavengering. It would be theirs to buy in the raw state, as they buy it now in the form of poudrette; and though they know nothing of nitrogenous materials, and calcic phosphates, and potash and lime, they have learnt by practice that the chief value of the poudrette lies in the ash Treating the sweepings judiciously, they would be 'exceedingly profitable,' but as they are treated now, their properties are wasted and their money value lowered.

"The last proposition is that the Secretary's Report 'fully and finally disposes of all idea of a sewage farm,' but I am sanguine enough to hope it will furnish a strong argument in favour of establishing one. Taking the daily consumption of water at 9,000 tons, it may be assumed, that, of this quantity, at least 5,000 tons become 'sullage water,' in no respect different from Bombay sewage: the quantity for which removal is provided in Colonel Ducat's scheme is 6,658 tons. Now Mr. Robertson says it would be unwise to provide for the removal, by drainage, of anything but the rainfall and the 'sullage water', and this implies that the 'sullage water' might be passed into sewers. But sewers must have an outfall somewhere, and if that outfall is not to be on a sewage farm, where else can it be? Will any one propose that 5,000 tons of foul sewage be discharged daily into a windward river, the head waters of which have been diverted by the construction of the Khadakvásla Lake and Canal?

"12. If the Municipality elect to retain the depôt, let them do so with their eyes open, and not under the mistaken idea that it is worked at a profit, or that their city is efficiently cleaned. Let them clearly understand, that under the present system they make 3,894 tons of poudrette, which costs Rs. 62,757, and sells for Rs. 30,776, thereby entailing a dead loss of Rs. 31,981. In the *Government Gazette* of the 15th June last, the actual expenditure is given at Rs. 67,774, so the real loss is Rs. 36,998. It cannot be too clearly explained that whilst only 14 tons of nightsoil are removed daily, upwards of 100 tons are uncollected and remain within the city to make its soil excrement sodden. Let it not be forgotten, that whilst a mere fraction of the 'sullage water' reaches the river to pollute its stream, the greater portion is absorbed in and around the houses; and that not one-fourth part of the dry refuse is removed. Is this a system to be retained, and is Colonel Ducat's scheme to be set aside on the groundless plea that 120 tons of nightsoil would make the slightest difference in 6,658 tons of 'sullage water'?

"13. Mr. Robertson says 'it is a point of grave importance that the Cantonment Committee should give up the contract system, and work in the same manner as the Municipality. Now in the Cantonment they expend Rs. 19,713, and receive from the contractor Rs. 8,500, so their net loss is Rs. 11,213. As the total of nightsoil and sweepings removed is 35,750 cart-loads, the cost of removal is 5 annas per load. In the city the loss is Rs. 36,998, and as the total of cart-loads is there 48,910, whilst the poudrette brings in Rs. 30,776, the cost of removal is 12 annas per load. Something of the working of the two places may be learnt from Appendix B, and I think it would be 'a point of grave importance' if the cantonment adopted the city system. But why should not the city adopt the cantonment system? At one sweep they would get rid of the expense of scavengering establishment, plant, and hautage; and then by increasing their supervision they might ensure that the contractor worked up to a far higher standard than has yet been reached.

"14. It will be a common misfortune if Municipalities—which are already, or which may be some day, in a position to avail themselves of a water carriage sewerage scheme—were to be deterred from doing so under the idea that a system, like that at Poona, can ever be really efficient, or worked at a profit. No idea can be more opposed to accepted teaching, and to facts and figures; and it might be embarrassing were it disseminated under the endorsement of Government. And for Poona itself it would be a special misfortune if, for reasons which cannot be sustained, the Municipality were now to give up a project on which they have already expended a large amount, and which has been stamped with the approval of England's greatest sanitary authority.

"15. As a wide publicity has been given to the Secretary's Report and its accompaniments, I would beg that the same may be given to this letter and its appendices."

Appendix A.

POONA MUNICIPAL EXPENDITURE connected with the removal of City Refuse and Nightsoil, and their subsequent conversion into Poudrette at the Depôt.

Taken from the Municipal Budget for 1881-82.

			Per month.	Per year.
For the City.	90 halálkhors*	at Rs. 9 each.	810	9,720
	160 „ *	„ 8 „	1,280	15,360
	36 „ *	„ 7 „	252	3,024
	6 bhistis	„ 12 „	72	864
	131 road sweepers	„ 4 „	524	6,288
			2,938	35,256
*For the Depôt.	1 mukádam	at Rs. 15	15	180
	1 „	„ 9	9	108
	12 halálkhors	„ 10 each.	120	1,440
	25 bigáris	„ 5 „	125	1,500
	1 bhisti	„ 12 „	12	144
			281	3,372
Haulage.	30 rubbish carts, 20 for whole year, and 10 for 6 months	at Rs. 20 each.	500	6,000
	25 nightsoil carts* ...	„ 24 „	600	7,200
			1,100	13,200
Contingencies.	Sanitary inspection† ...	Rs. 4,944 per annum.	4,319	51,828
	New dust-bins† ...	„ 500 „ „		10,929
	„ nightsoil and refuse carts† ...	„ 1,000 „ „		62,757
	Repairs to old bins† ...	„ 250 „ „	By sale of Poudrette.	30,776
	„ „ carts† ...	„ 3,000 „ „		
	„ „ Depôt* ...	„ 200 „ „		31,981
	Rent of Depôt* ...	„ 100 „ „		
	Street-cleaning contingencies	„ 135 „ „		
	Scavengering	„ 800 „ „		

* These charges are solely connected with the collection of nightsoil, and its subsequent conversion into poudrette ... ... Rs. 38,676

† These charges are for scavengering also, and one-half only has been taken ... ... „ 6,157

Rs. 44,833

Appendix B.

COMPARATIVE STATEMENT of Scavengering and Halálkhor Service in Poona City and Cantonment.

City—From Municipal Secretary's Report, dated 8th July 1882.

Scavengering—

86 cart-loads per day from 99,421 persons.

86 × 365 = 31,390 ÷ 99,421 = 0·31 of a load (nearly ⅓) per head per year.

86 = 43 tons = 96,320 lbs. per day = 0·969 lbs. (nearly 1) per head per day, or 353·6 lbs. per year.

Halálkhor Service—

48 cart-loads per day = 14 tons = 625 cubic feet = 3906·25 gallons.*

This from 99,421 persons gives 0·039 gallon per head per day, or 14·235 per head per year.

In lbs. it would be 39062·5 per day, or 0·3929 per head, or 143·41 per head per year = 6·28 ounces per head per day.*

Estimated quantities, see para. 5.	Fæces at	2·5 oz. per head per day =	6·94 tons	
	Urine „	40 „ „ „ =	110·96 „	
	Water „	8 „ „ „ =	22·19 „	
Per head per diem ...	50·50	Total to be removed daily	140·09 „	
	6·28 „	removed „	17·4 „	
	44·22	Remaining daily	122·65 „	

Cantonment—From Cantonment Magistrate's Report, dated 27th September 1882.

Scavengering—

72 cart-loads per day from 19,273 persons.

72 × 365 = 26,280 ÷ 19,273 = 1·36 loads (1½) per head per year.

72 = 36 tons = 80,640 lbs. per day = 4·18 lbs. per head per day, or 1525·70 lbs. per year.

Halálkhor Service—

26 cart-loads = 7·6 tons = 339 cubic feet = 2118·75 gallons.*

This from 19,273 persons gives 0·11 gallon per head per day, or 40·15 per head per year.

In lbs. it would be 21187·5 per day, or 1·1 per head, or 401·5 per head per year = 17·6 ounces per head per day.†

Estimated quantities, see para. 5.	Fæces at	2·5 oz. per head per day =	1·34 tons	
	Urine „	40 „ „ „ =	21·51 „	
	Water „	8 „ „ „ =	4·30 „	
Per head per diem ...	50·5	Total to be removed daily	27·15 „	
	17·6 „	removed „	9·46 „	
	32·9	Remaining daily	17·69	

* 6·25 gallons = 1 cubic foot.
† 10 lbs. = 1 gallon of water.

REPORT ON ADEN.

Inspected in January 1883.

38. In reporting on Aden I have made free use of Captain Hunter's interesting compilation; but my observations chiefly apply to the civil area, as Deputy Surgeon General Bruce had so recently inspected the military limits. In this case the civil area includes the new settlement at Sheik Othman on the mainland.

39. In addition to the older camp and town within the Crater there is the more important and extending position at Steamer Point. There are also the purely military positions at the Isthmus and Khor Maksar where lines have been established for the Aden Troop: so, with Sheik Othman, there are five distinct places. In all that relates to public health, however, the same rules are observed, and all may be taken together under different headings. The Municipality carry out the conservancy arrangements both in civil and military limits, and they work under an admirable system: in fact their printed rules for guidance would do credit to a more elaborate organization.

Water-supply.

40. The water-supply is from wells, condensers, storage reservoirs, and the Sheik Othman aqueduct. Within the Crater there are numerous wells along the base of its eastern slopes, and the best are in the Khunaf, Tawila, and Edroos valleys. Many of them "are sunk in the solid rock to a depth of from 120 to 190 feet: in the best the water stands at a depth of 70 feet below sea level." The best of all is the Banian well in the Khunaf valley, and its average daily yield is 2,500 gallons. Other wells are fairly good, but in some nearer the shore-line the water is no longer potable, though it serves for various domestic uses, street watering, &c. The people generally are now less dependent on this source of supply, but even now what is called sweet water is only to be had by purchase. Under the circumstances the average daily consumption cannot be one gallon per head.

Wells.

Storage reservoirs.

41. The ruins of some 50 storage reservoirs have been found, and 13 in the Tawila valley have been restored at a cost of Rs. 3,75,000: the work of renovation commenced in 1856, and there is now a storage capacity of 7,718,630 gallons. They filled for the first time on the 23rd October 1857 "when though a very small proportion of the whole had been repaired, more water was collected from a single fall of rain than the whole of the wells would yield in a single year." Since their entire restoration they have only filled on three occasions: once in May 1864, again in May 1870, and a third time in September 1877. The heavy rainfall in 1872-73 did not *fill* them, though 8·69 inches were then gauged. With a recurring rainfall, as in India, these reservoirs would be invaluable; and there would be the additional advantage that the water might be distributed by gravitation. In Aden, however, rain is exceptional, and as a rule the reservoirs are practically empty. Fortunately neither wells nor reservoirs are any longer main sources of supply.

Condensers.

42. There are both Government and private condensers, and their yield may be increased almost illimitably. For the troops and others at Steamer Point it is a floating one, and it also works at the Isthmus which formerly had its own. Within the Crater there is a stationary one at Seerah, and the bakery engine also condenses during its working days—some 20 every month. Of private condensers the P. and O. Company have one at Steamer Point to supply their own wants. Messrs. Luke, Thomas & Co. and Messrs. Edaljee Manekjee and Sons have one each near the Little Pass, and they supply the shipping and the general public. There are two Government storage cisterns at Steamer Point, two at the Isthmus, and one in the Crater; and the subjoined statement shows the storage capacity, the daily yield, and the daily issues:—

Government Condensers.

Locality.	Storage.	Yield.	Issues.
	Gallons.	Gallons.	Gallons.
1. Steamer Point	120,000	7,000	2,500
2. Isthmus	320,000	5,600	2,200
3. Seerah	80,000	9,000	4,500
	520,000	21,600	9,200
4. Bakery engine	.....	400	.....
		22,000	

At 5 gallons per head per diem 9,200 gallons will supply 1,840 men. The issue from the bakery is not daily: it is made when some 8,000 gallons have been condensed. The Native troops take it.

Private Condensers.

	Gallons per day.
1. P. and O. Company	... 9,000
2. Messrs. Luke, Thomas & Co.	... 12,000
3. Messrs. Edaljee Manekjee & Sons	... 4,000
	25,000
Government	... 22,000
Total	... 47,000

This gives 5 gallons per head per diem to 9,520 persons.

In 1875-76 the working cost of the 3 Government condensers was Rs. 18,077, and the following were the selling prices of the water:—

	Per 100 gallons.
At Steamer Point	... 3 0 9
At Isthmus	... 3 4 6
At Camp (Crater)	... 2 10 9

The quantity sold has not been given, so no balance can be struck: the prices were prohibitive for the poorer classes.

Sheik Othman Aqueduct.

43. In 1867 Government obtained from the Sultan of Lahedj a concession to bring in water from Sheik Othman to Aden, and two wells were taken over to serve as head works. Platforms were built round them; they were caged in, fitted with Burgess and Key's lift pumps, and one camel works them alternately for 8 or 10 hours a day. They are connected with an aqueduct which was constructed at a cost of Rs. 2,96,933, and the yield is about 8,000 gallons a day: it might be increased indefinitely. The aqueduct, which is 6 miles in length, has an average section of 8″—it is square with brick sides, and stone slabs above and below: there is an inside coating of cement 1″ thick—there are silt traps at intervals, and the whole is banked with earth. The level at No. 1 well is 48′·61 and it is 26′·95 at the supply cistern within the Isthmus position, so the fall is only 3′·66 per mile. From the Isthmus cistern the water is supplied to Native troops and followers, and cattle, and it is sold to the public. The price was Re. 1 per 100 gallons, but it is reduced to 3½ annas, and the reduction will probably increase its sale. The Commissariat returns give the following distribution:—

	Gallons.
At Isthmus	... 4,030 per month.
At Steamer Point	... 3,177 ,,
At Camp	...221,775 ,,
General public	... 15,088 ,,
	30)243,990 ,,
	8,133 per day.

The average contract cost of conveyance to the Crater camp is about Rs. 350 per month, and to Steamer Point about Rs. 400—or Rs. 9,000 per year for both.

Extra supply from Sheik Othman.

44. In addition to the supply by the aqueduct, there is a brisk carrying trade from wells at Sheik Othman, and in 1875-76 there were passed through the barrier gate 71,910 camel-loads, equal to 3,500,000 gallons.

Suggested improvements.

45. As the question of water-supply is all-important, I have no hesitation in urging the adoption of certain measures for its improvement, even though they entail considerable outlay. The flatness and insipidity of condensed water everywhere is a marked feature, and there are various means to aërate it, one or other of which might be tried. For the sick it is indigestible, and to all it is at first mawkish and unpalatable. Where there is sufficient head a fall in a broad sheet is effective, or a broken fall down a stepped plane, or discharge into the supply cistern by a disc which delivers in a thin filmy curved dome—as one sees in ornamented fountains. As the atmosphere is so clear the cisterns might be uncovered if the rate of evaporation would permit it. I have not been able to find out whether the aqueduct has ever been overhauled, but no one can follow it across the salt marsh over which it is carried without seeing that it must be thoroughly impregnated throughout its length. Where it crosses a back water near Khor Maksar it is at times submerged by the tide, and whilst the water *lifted* is fairly good, that *delivered* is barely potable. To wash the salt out of the aqueduct is simply impossible, and to retain it as a channel, in its present condition, is to defeat the object for which it was constructed. It would be costly to provide a damp proof course along its length, and this possibly might not answer: so, the pressure being nothing, I would suggest that stoneware pipes of suitable diameter—6″ or 9″—be laid in the existing channel, which should be well lined throughout with pitch. I would further suggest, with a view to save the *constant* charge for conveyance—Rs. 9,000 per annum—that the piping be continued round by the shore line to Front Bay, there to end in a supply cistern. The Executive Engineer says this extension is quite feasible, and not very costly: in fact, he himself has recommended it. The distance by the shore line is 3,600 yards, but the first 1,600 are along the glacis of the fortifications: for the remaining 2,600 yards a roadway would have to be made, and the total estimated cost is only Rs. 14,000. This includes *old* pipes now in stock, but it would be true economy in the long run to lay down new pipes. These pipes might be so arranged as to pass the Seerah water to the Isthmus, and thus save the moving of the floating condenser from Steamer Point. The boon to the civil community would be untold, and the water would find a far readier sale than now. At the mere cost of another camel or two working, the yield at Sheik Othman might easily be doubled, or quadrupled; or it might be advisable to sink other wells either adjoining, or in the new settlement, and connect them with the aqueduct. The estimated cost of 6 miles of 9″ stoneware piping is Rs. 31,600; but taking it, with the cost of shore line extension, at Rs. 54,000, this is just 6 years' cost of conveyance at present rates.

Stoneware piping to be laid within present aqueduct.

Surface conservancy.

46. The surface conservancy is well carried out. The dry sweepings are taken to selected sites, and there burnt. A speculative Frenchman has purchased one year's right to them, and he may be seen daily superintending the screening and packing for export to France. With imported soil, or possibly at Sheik Othman, a use may yet be found for them. Latrine refuse is buried, also at selected sites, and this, too, may yet be utilized. It is difficult to say how the separation is effected, but the solids are removed in those objectionable regulation iron cylinders: whilst the liquid portion is carried in iron cylinder carts. Were these of the Bombay municipal pattern, solids and liquids might go together, and after work the cart might be backed into the sea, and well washed out. The haulage is done by camels, and Crowley's swing barrel carts would be useful. As they are made of all sizes, even for hand draught, the smallest would advantageously replace the regulation iron cylinder. Within the Crater, and at Steamer Point, cesspools have existed from the first occupation, and now they may be counted by thousands: in fact, each house has

Cesspools.

one or more. They are unlined pits, and cleaning is unknown. In theory they are all that is bad, but owing perhaps to the peculiarity of the climate, and to the fact that they cannot pollute the water-supply, they seem to be of little consequence : at the same time no opportunity should be lost of abolishing them, and substituting impervious receptacles above ground. I inspected several houses, including many occupied by Somalis, and it is only fair to say, that both houses and courtyards were surprisingly clean : my visits were unexpected.

Markets.

47. In the Camp Market the stalls open on a walled court, and if the arrangements are somewhat rough they serve their purpose. As funds permit it would be advisable to replace all pavement by good concrete.

Latrines.

48. The latrines are everywhere well built—in fact, too well, for they are of cut stone and lime masonry—however they are built, and are fairly well served. It is here that the hand swing barrels would prove so useful. I would suggest that future latrines be made somewhat after the Kárwár pattern.

Slaughter-houses.

49. The Camp Slaughter-house is private property, but it is well looked after, and it was scrupulously clean. No slaughtering is allowed except at established places subject to supervision.

Jails.

50. The Jail was inspected, and, like all jails I have seen, it was in perfect order.

The Bakery.

51. The Government Steam Bakery turns out 900 first sort loaves daily, and about 38,000 lbs. second sort flour per month for issue to Native troops and followers. The engine works for some 20 days a month, and it then condenses about 400 or 500 gallons a day: this water is issued to Native troops. The condensing arrangements might be improved. Whatever the arrangements on the upper floors, those on the basement are faulty. One room now contains the engine, two biscuit machines—not yet used—and the kneading machines : in addition there are the kneading tables, the presses, and the ovens. There is a nominal division by two open arches, and these should certainly be screened, so as to isolate the machinery. A winnowing machine is talked of, and if it be built, a portion of it might be reserved, and closely screened, for the kneading machine, and tables, and the biscuit machines. Flies in Aden are a plague, and at my first visit I saw the dough literally *covered* with them. The engine has been jammed against a wall, which might be pierced with advantage; and means are needed to stop the engine immediately in the event of anything going wrong in the mill-room.

Faulty arrangements.

Seerah Causeway.

52. The roadway which connects Seerah with Aden has had the effect of silting up Front Bay, though a contrary result was expected. The Executive Engineer has submitted a plan for cutting it, and I would strongly urge that it be sanctioned.

Sheik Othman.

53. The new settlement at Sheik Othman on the mainland has been well laid out in rectangular plots with fine broad streets—the centre one is 300 feet. Wells have been sunk, and provided with stone parapets and pavements draining to future trees. The best well is now being sunk near the police station, and the water from the trial one alongside is really very good, better perhaps than that of the aqueduct supply wells. Houses are springing up fast, and already an attempt is being made to manufacture poudrette : any amount of it can be used to form market gardens for Aden. It cannot be too strongly and too frequently impressed upon all concerned, that the new settlement is directly over the water-bearing stratum, and every effort must be made to prevent this becoming polluted. Under no circumstances must one single cesspool be permitted. Here they would be a positive source of danger, and it will require close and constant supervison to prevent their being made inside private court-yards. I saw one in the house of an Arab merchant, near the aqueduct, which was horribly filthy : the bath-waste from an upper story was brought down to it, and it might with advantage have been run on to the garden alongside.

Dangers from cesspools.

With it came the nightsoil and urine, and as there are no appliances for cleaning out the cesspool, the condition may be imagined. The bye-law on this point cannot be too stringent.

Future of Sheik Othman.

54. A time *must* come when the inland trade will centre at Sheik Othman instead of at the old town in the Crater and Maala Bandar. A pier is now being made, alongside of which dhows may discharge and load; and a good road will connect it with the town. A steam ferry would then establish direct communication with Steamer Point and Maala Bandar. Such trades as coffee-cleaning, lime-burning, dyeing, &c., might have places assigned to them at once, as might dhobis, day labourers, and all non-productives. With all deference the dispensary requires a younger and more active man, and hereafter it will have to be enlarged. As the town increases and draws people away from Aden it might perhaps be advisable to transfer the "Prince of Wales" Dispensary; but this, of course, is for future consideration. It is impossible to ignore the possibility of the new town superseding the older one, and it will be well to facilitate every arrangement which bears upon this contingency.

LATRINE.

New pattern latrine.

55. In para. 104 of last year's Report a latrine was described, and a plan of it was given. Its advantage is that it may stand alongside of buildings such as are fast springing up in Bombay, and there would be no difficulty in adapting it to a sewerage system. For the districts, however, the plan then shown might mislead as being too costly: so during last rains the Executive Engineer prepared for me a more suitable plan, and a model was erected in his office enclosure.

See plan.

Its chief merit is that there is no lime masonry about it, and no ground to be fouled. Its materials can be suited to local conditions. Under Government Resolution in the Public Works Department, No. 86 C. W.—192, dated 12th February 1883, this plan is to be looked on as a standard for guidance.

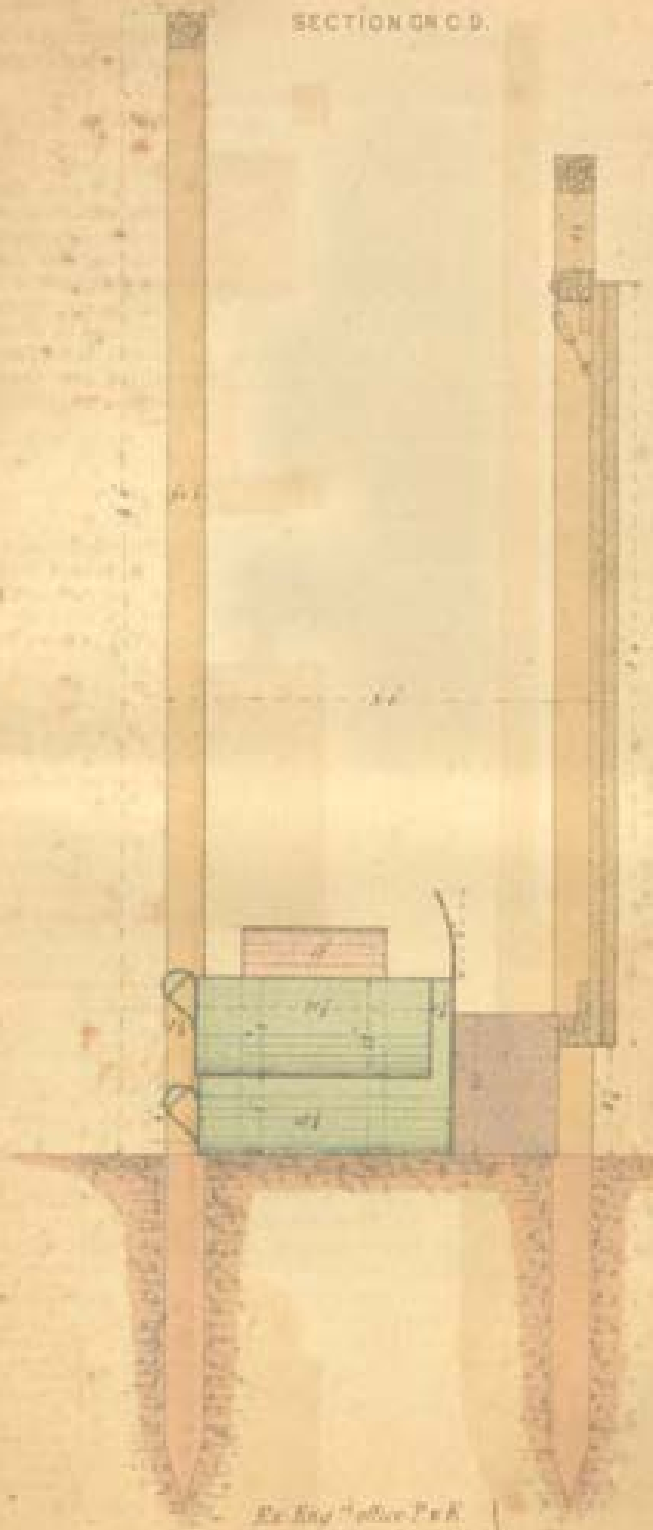
WATER ANALYSES.

Samples of Water analysed by Assistant Surgeon Sorabji Manekji Kaka, Travelling Water Analyst, Sanitary Department, Bombay.

Number of Samples	Date.	Station.	Source.	Grains per Gallon.		Parts per Million		Sediment, &c.	Quality.
				Total Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.		
	1882.								
1	30th May ...	Nasik ...	River Godávari above the town, at the extreme west, at Agni Tirth, close to Mahlar Tekri.	29·3	1·54	·026	·2	Copious, vegetable debris, monads, paramœcia, rotifers.	Bad.
2	31st do. ...	Do. ...	Do. do. do. ...	22·2	1·54	·04	·48	Do. do. do. ...	Do.
3	do. ...	Do. ...	Do. do. do. ...	21·	1·54	·026	·44	Do. do. do. ...	Do.
4	1st June ...	Do. ...	Post office well (Vakilbawri) ...	57·4	8·05	·0122	·01	Scanty, vegetable debris, monads, paramœcia, rotifers.	Do.
5	do. ...	Do. ...	Purushram's well opposite Collector's house	36·4	1·61	·32	·14	Scanty, vegetable debris, monads	Do.
6	2nd do. ...	Do. ...	Bhande-ad well in Halli Aditwar	54·6	6·23	·052	·04	Scanty, vegetable debris, monads, paramœcia, algæ, confervæ, diatoms.	Fair.
7	3rd do. ...	Do. ...	Bardes' well	33·6	2·87	·40	·32	Copious, vegetable debris, paramœcia, bursarina, euplotæ, rotifers.	Bad.
8	do. ...	Do. ...	Well in Mahlar Tekri Garden ...	29·4	1·54	·04	·09	Scanty, vegetable debris, monads, paramœcia.	Good.
9	4th do. ...	Do. ...	House	32·2	1·4	·0	·11	Copious, vegetable debris ...	Fair.
10	7th do. ...	Camp Baroda	New Bakery well	53·9	3·08	·2	·08	Scanty, vegetable debris, monads, paramœcia.	Bad.

MODEL DISTRICT LATRINE

SECTION ON C D.

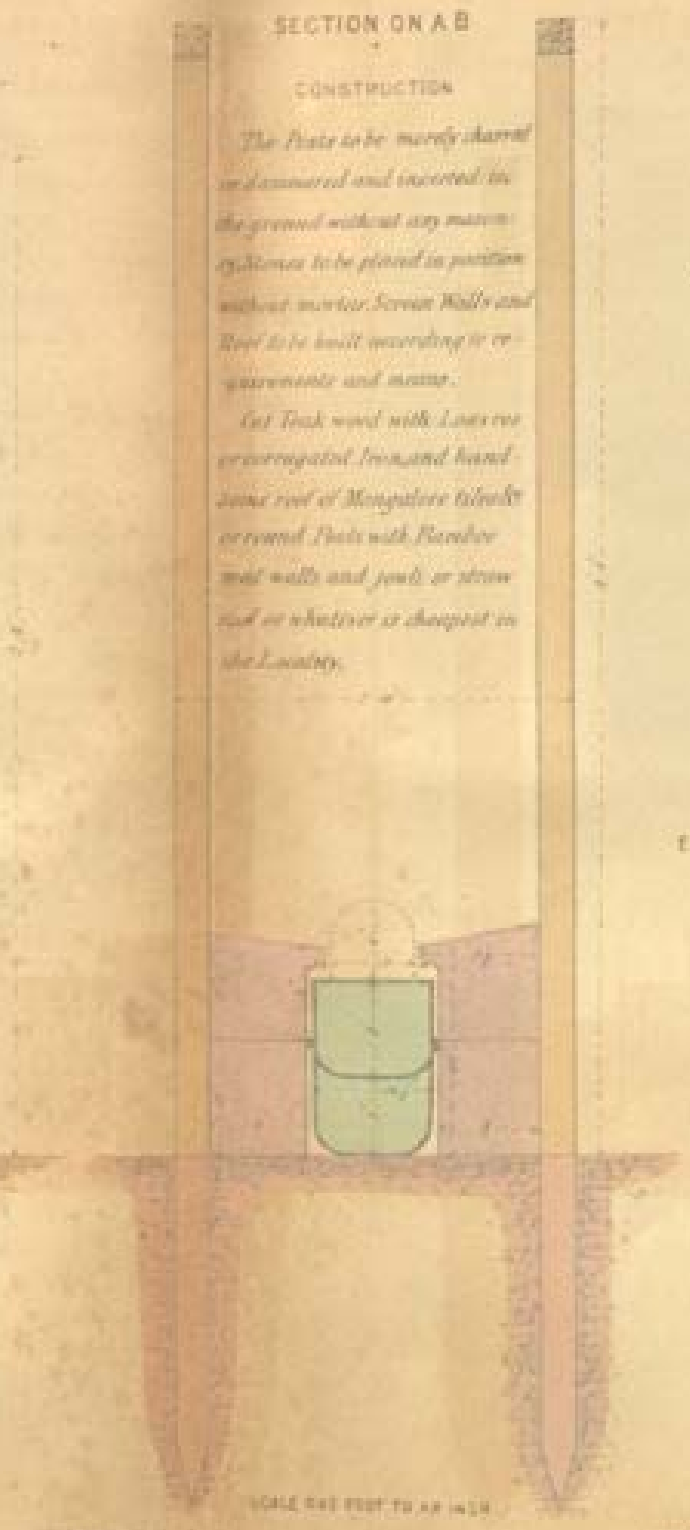


SECTION ON A B

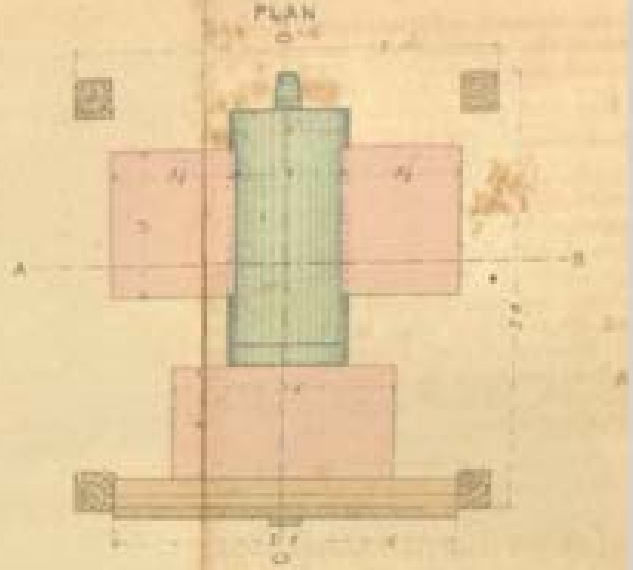
CONSTRUCTION

The Posts to be neatly charred or dammared and inserted in the ground without any masonry. Stones to be placed in position without mortar. Screen Walls and Roof to be built according to the requirements and means.

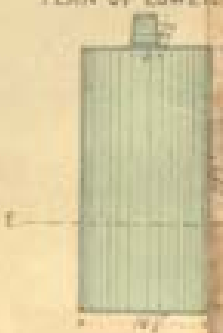
Cut Teak wood with Louvres or corrugated Iron and hand some roof of Mangalore tiles if or round Posts with Bamboo mat walls and jowli or straw mat or whatever is cheapest in the Locality.



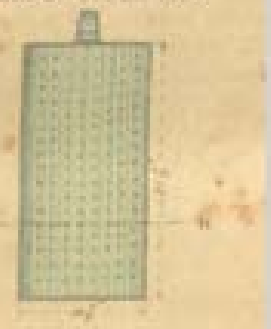
PLAN



PLAN OF LOWER PAN



PLAN OF UPPER PAN



SECTION ON E F

SECTION ON C H.

FRONT ELEVATION OF LOWER PAN

FRONT ELEVATION OF UPPER PAN

Rc Roy Collector P & K
Poona 6th October 1852

SCALE ONE FOOT TO AN INCH

Lithographed, Govt. Photozincographic Office, Poona 1852

Samples of Water analysed by Assistant Surgeon Sorabji Manekji Kaka—continued.

Number of Analysis.	Date.	Station.	Source.	Grains per Gallon.		Parts per Million.		Sediment, &c.	Quality
				Total Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.		
	1882.								
11	8th June ...	Camp Baroda	Well in Rewa Kántha bangalow..	45·5	1·54	·026	·08	Scanty, vegetable debris, monads, paramœcia.	Good.
12	do. ..	Do. ..	Camp well...	37·8	2·38	·0132	·07	Do. do. do. ...	Do.
13	3rd and 4th July.	Bombay ..	Water from Tulsi Lake taken from the surface.	5·6	1·05	·026	·44	Copious, vegetable debris, conferve, diatomaceæ, desmidæ.	Bad.
14	do. ..	Do. ..	Do. do. from the middle strata.	4·2	·98	·532	·22	Do. do. do. monads, paramœcia.	Do.
15	do. ...	Do. ..	Do. do. from the bottom of the lake.	11·9	1·05	In very great excess as to give a copious precepitat with the test of Nepler.	·44	Do. do. do. do. ..	Do.
16	21st July ..	Do. ...	Tulsi water from a pipe in New Sonapur Lane, Dhobi Talav.	7·	1·05	Nil·	·14	Copious, vegetable debris, algæ, conferve, monads, paramœcia.	Do.
17	24th do. ..	Do. ..	Sample of water drawn from the surface of the Tulsi Lake.	7·7	1·05	·026	·22	Copious, vegetable debris, conferve, monads, paramœcia.	Do.
18	do. ...	Do. ..	Do. from the middle strata of the Tulsi Lake.	7·7	·98	·026	·21	Do. do. do. ..	Do.
19	25th do. ..	Do. ..	Do. from the bottom of the Tulsi Lake.	7·7	1·05	·052	·20	Do. do. do.	Do.
20	do. ..	Do. ..	Sample of water drawn from the surface of the Vehar Lake.	7·	1·05	·026	·19	Scanty, vegetable debris, algæ, conferve, monads, paramœcia.	Do.
21	26th do. ..	Do. ..	Do from the middle strata of the Vehar Lake.	6·5	1·05	·04	·25	Copious, vegetable debris, algæ, conferve, monads, paramœcia.	Do.
22	do. ..	Do. ..	Do from the bottom of the Vehar Lake.	9·1	1·05	·08	·20	Do. do. do. do. ..	Do.
23	24th August...	Baroda (Camp.)	Mr. Krishnarao's well	52·5	5·67	Nil	·01	Scanty, vegetable debris, monads	Fair.
24	do. ..	Do. ..	Well in compound of Cantonment Magistrate's Office.	56·	5·04	·0132	·11	Do. do. paramœcia.	Do.
25	25th do. ...	Do. ..	Bázár well	88·0	14·7	·052	·07	Do. do. do. cute-mostraceæ, crystals of mineral matter.	Bad.
26	do. ...	Do. ..	Mr. Dadabhoy's well	56·	6·37	·026	·06	Scanty, vegetable debris, paramœcia.	Fair.
27	do. ..	Do. ..	„ Mancherji's well	135·1	24·08	Nil.	·07	Scanty, vegetable debris, monads	Bad.
28	26th do. ..	Do. ..	„ Shapurji's well	69·3	4·55	·052	·07	Do. do. do. ..	Do.
29	do. ..	Do. ..	Mirbaker Ali's well	109·9	9·87	·026	·03	Vegetable debris, monads, paramœcia, euplotæ.	Do.
30	do. ..	Do. ..	Well in Mr. Furdunji's garden...	143·5	23·1	·052	·09	Vegetable debris, monads	Do.
31	27th do. ..	Do. ..	Nursurpur Ali's well	102·2	22·05	Nil.	·12	Scanty, vegetable debris, pds	Do.
32	do. ..	Do. ..	Well used by Dhers near Government garden.	45·5	6·51	·0132	·06	Nil	Good.
33	do. ..	Do. ..	Do. No. 154 used by sweepers near Government garden.	32·9	3·78	·052	·08	Nil	Do.
34	28th do. ...	Do. ..	Do. in compound of old bakery	166·6	39·9	·026	·02	Vegetable debris, monads, paramœcia.	Bad.
35	do. ..	Do. ..	Do. in compound of Travellers Bangalow.	57·4	6·09	Nil·	·06	Very scanty	Fair.
36	do. ..	Do. ..	Do. No. 136 near Native Infantry Quarter Guard.	37·1	3·15	·026	·07	Very scanty, vegetable debris, monads.	Good.
37	29th do. ..	Do. ..	Do. No. 137 used by Dhers and moochees of the 26th N.I.	27·3	1·12	·79	·12	Vegetable debris, monads, paramœcia, rotifera.	Bad.
38	do. ..	Do. ..	Native Infantry Bázár well No. 138.	60·	3·36	·04	·03	Copious, vegetable debris, monads, paramœcia, crystals of mineral matter.	Fair.
39	do. ..	Do. ..	Purveyor's well No. 139... ...	49·	3·29	·04	·08	Scanty, vegetable debris, monads	Good.
40	30th do. ..	Do. ..	Purdasee's well No. 140 ...	45·5	3·64	·026	·11	Vegetable debris, monads, paramœcia, diatomæ, crystals of mineral matter.	Do.
41	do. ..	Do. ..	Well No. 151 opposite Workshop.	44·1	5·18	·026	·04	Vegetable debris, paramœcia ..	Do.
42	do. ..	Do. ..	Parade ground well No. 150 ...	31·	1·4	·052	·09	Vegetable debris, paramœcia, monades euplotæ.	Do.
43	31st do. ..	Do. ..	Do. in old N. I. lines, No. 153.	38·5	4·06	Nil.	·09	Scanty, vegetable debris, paramœcia.	Do.
44	do. ...	Do. ..	Do. No. 142 on west side of Barracks.	60·	8·05	Do.	·07	Scanty, vegetable debris, monads, paramœcia.	Fair.
45	do. ..	Do. ..	Do. No. 143 opposite European Infantry Quarter Guard.	37·1	3·05	D·.	0·07	Very scanty, vegetable debris, monads, paramœcia.	Good.

Samples of Water analyzed by Assistant Surgeon Sorabji Manekji Kaka—concluded.

Number of Sample.	Date.	Station.	Source.	Grains per Gallon.		Parts per Million.		Sediment, &c.	Quality.
				Total Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.		
	1882.								
46	1st September	Baroda (Camp).	Well No. 144 opposite officers' gymnasium shed.	32·9	2·38	·026	·08	Nil ...	Good.
47	do.	Do.	Well No. 148 opposite Station Hospital.	73·5	9·1	·106	·07	Scanty, vegetable debris, monads, paramecia.	Bad.
48	do.	Do.	New well opposite A Barrack ...	36·4	2·31	Nil.	·04	Very scanty, vegetable debris ...	Good.
49	2nd do.	Do.	Well near the Agent's office. ...	30·1	3·64	·0132	·05	Do. do. ...	Do.
50	do.	Do.	Well in front of the Agent's bangalow.	41·3	3·78	Nil.	·06	Vegetable debris, monads, paramecia, *rotifera*, vorticellæ, bursariæ.	Bad.
51	do.	Do.	Well on the west side of the Agent's bangalow.	55·3	6·72	Nil,	·07	Vegetable debris, monads, paramecia.	Fair.
52	9th do.	Abu	New well situated in the vicinity of barracks.	7·	1·54	·106	·07	Copious, vegetable debris, monads, paramecia confervæ, fine clay.	Do.

DISINFECTING CHAMBER.

56. There is a great want of some reliable means of thoroughly disinfecting the clothing, &c., of persons who have died of, or recovered from, what are commonly known as infectious diseases—such as cholera and small-pox. If the municipalities of the larger towns could see their way to supply the want, it would be of immense benefit to the people generally, and would greatly tend to check the spread of these diseases. The following extract from a letter to the Executive Engineer, Poona, will give an idea of what is wanted, and it may be of assistance to local authorities. It had been proposed to construct a chamber in the verandah of a building :—

"It must be remembered that, when heat is employed, a temperature of 240° Fah. should be maintained, and this could not be done against the wall of an occupied room, nor could vapours be used under an occupied roof. The Liverpool chambers are arched, of solid brick work, with doors of wrought iron accurately fitting into cast-iron frames. The floor has double iron sliding gratings, and beneath it a hot-air passage. The dimensions are 5 feet wide, 7 feet from back to front, and 6½ feet high. The arch is also furnished with a valve through which the air escapes into an exhaust shaft. Two cast-iron smoke flues pass from a cast-iron cockle along the hot-air passages into a chimney placed at the further end (at Poona the tower might be utilized). There are also arrangements for regulating the temperature. The ordinary temperature is 240° to 250° Fah., but it can be raised to 280°. Fraser's patent apparatus is a brick oven or chamber about 8' square, with doors in front. In the lower portion of this is a furnace covered, and with flues capable of raising the air inside to the required temperature. There is also a closed truck, or carriage, provided with shelves, racks, dampers, and doors. The clothes and bedding are collected in this carriage from the infected houses, and brought to the chamber. The doors of the chamber are opened, and the carriage placed inside. Disinfection then takes place, sulphur and other fumes being used. When the process is completed, the carriage is taken back to the house, and the articles are removed. The following are the chief points in this apparatus. The vapours given off are passed through the furnace and consumed. The clothing is not removed from the carriage till returned to the owner; the carriage is itself disinfected. A temperature of 220° Fah. may be maintained in the interior of the flock bed.

"Such are Blyth's descriptions of 'disinfecting chambers', and it will be seen that they could not well form a portion of an occupied building. From these descriptions, and others, the Executive Engineer here has devised a plan of chamber, and a copy of it would, no doubt, be obtainable on application."

JOHN LUMSDAINE,
Sanitary Commissioner.

April 30th, 1883.

REPORT ON THE CANTONMENT OF NASIRABAD.

Inspected in November 1882.

The Cantonment of Nasirabad is situated in latitude 26° 18′ north and longitude 74° 46′ east, in the British District of Ajmere Marwarra, at a height on the north of camp of 1,470 feet, whilst on the south the rising ground on which the Native Infantry Hospital stands is only 1,407 feet above mean sea level. It is 15 miles distant by rail from Ajmere and 135 from Neemuch, with which stations it is connected by the Rajputána Railway and also by made roads. The Cantonment stands on an open sandy plain, sloping towards the south with a more gradual fall on the east and west, and is about 3½ miles distant from the nearest point of the eastern ranges of the Aravalli Hills, which extending, although not continuously, from near Delhi to the south of Mount Abu, pass Nasirabad about 6 miles away on the north and west. These ranges do not attain the same altitude as the western, and the hills approaching Nasirabad from the north-east to south-west are not in places above 3 or 400 feet in height: but they form the water-parting of the Bay of Bengal and the Arabian Sea, as the rain which falls on their eastern slopes finds its way into the river Chambul, and so into the Ganges and the Bay of Bengal, whilst that falling on the western face runs into the Loni River, which, traversing Western Rajputána, is discharged into the Gulf of Cutch and the Arabian Sea. A dip in the ridge of the hills between the Cantonment and Ajmere permits a view of the Fort and Sanitarium of Taragurh, as the peak immediately above Ajmere is called, which, rising above the valley for a height of about 1,350 feet, attains an elevation of 2,885 feet above mean sea level. Heliographic communication is thus possible between the two stations, and is daily carried on between April and November, the season during which convalescents are sent up to Taragurh for change of air.

The geological formation of the district principally consists of a micaceous or hornblende schist in which there are masses of compact felspar. Good building material in the shape of slabs, which are used for paving and roofing purposes and for door-frames, &c., is found within a short distance of the hills, which present a serrated and jagged appearance, and at a distance seem to be entirely destitute of vegetation, though on near approach they are seen to be covered with bushes of euphorbia. I am informed that efforts are being made to encourage the growth of trees on these hills, which, if successful, will doubtless have a marked influence on the climate.

The country between the hills and the Cantonment consists of a sandy plain which drains down to a nála running from north to south about ½ a mile on the west, which has been embanked in its course; and a tank, called the Lal Diggi, is formed in the Commissariat garden opposite the Artillery Lines, where Major Murray, the Executive Engineer at Nasirabad, many years ago did excellent service by planting a thick grove of trees, which have now grown up and for some distance form a barrier to the advance of the sand which formerly was blown in vast quantities across the parade ground. The plain over the far side of the nála is seen to be covered with a coarse grass indicating moisture in the sub-soil. The country on the south is more open and is undulating. On the south-east the hill of Bhunaee, 14 miles away, forms a prominent feature in the landscape, whilst on the east is a broad plain with a few low hills not far from the Cantonment. The site of villages is for the most part marked by tanks, some of very large area, formed by building a wall or throwing an embankment across and on either side of a nála which thus arrest the monsoon rainfall. These irrigation tanks are absolutely neces-

sary for agriculture and form the principal source of drinking water-supply in the district; but the supply in the wells near them is precarious, as the water level sinks rapidly after the tanks become dry. There is a marked absence of large trees or jungle in the country all round Nasirabad, but there is a good deal of sub-marshy ground to be found to the south-west of camp after the rains, and there are several favourite snipe grounds within a distance of 6 or 7 miles. The Cantonment itself has a ridge running from north to south and drains on either side through various water-courses on the east and west. There exists the greatest divergence in opinion on the subject of the sufficiency of the surface drainage. Surgeon-Major Chapman, A. M. D., who has been in Nasirabad since 1879 and who has exhibited the greatest zeal and ability in the discussion of the various sanitary questions affecting the station, says in his Report of Medical Transactions of the 2nd Battalion of the Leicestershire Regiment for 1881:—

"The drainage is very imperfect and not sufficient to carry off half the water which falls during the monsoon season; consequently what remains lodges and, possibly, is injurious to health. However, this requires the expenditure of money to remedy the defect, as the drains consist merely of trenches cut in the loose soil without masonry; and as the average rainfall is only about 16 or 17 inches, I suppose the expenditure is not considered justifiable."

Surgeon-Major Beattie in the Medical Transactions of the Worcestershire Regiment for 1881 says:—

"The ground in the immediate vicinity of the barracks is in many places so level as to render thorough surface drainage impracticable although the annual rainfall is only about 17 inches and the soil is of a light, sandy, porous nature: there must be a great difficulty in keeping the surface clean during the wet season, more especially as the surface drains are merely trenches in the ground and not pucca built."

On the other hand, Major Murray informs me that the surface drainage is quite sufficient to carry off the storm water, but says that perhaps sub-soil drainage is requisite. The following extract from his letter, No. 1114, to the address of the Brigade Major, Nasirabad, dated 28th October 1882, on a reference from Deputy Surgeon-General Fraser on this subject, will be read with interest:—

"I consider that the surface drainage of the lines occupied both by British and Native troops and also of the Officers' Lines at this station is as perfect almost as it can be made. I make this statement from personal observation extending over some 14 or 16 years. I am prepared to state that one hour after rain on any occasion has ceased to fall, no pool of water will be found anywhere on the area described, unless from the temporary obstruction caused by drift and blocking one of the surface water-course. Such obstructions are rapidly cleared by gangs employed for the purpose. It is not a fact to my knowledge that any drain is unable to carry off the water that does or should flow into it, nor is it a fact that much of the water is allowed to soak into the ground owing to the absence of [illegible] of sufficient section.

"The depth of what may be called soil or earth overlying the natural rock formation does not exceed 7 feet anywhere. Over much of the area it is only from 1 foot to 3 feet deep: of this from 6 inches to 2 feet is composed of drift sand mixed with clay and vegetable matter; below this the soil is that which results from the decomposition of felspathic rocks, and so on down to harder rock. Until rock is reached the soil may be called more or less porous, and during continuous rain it does no doubt absorb and hold up water as would a sponge. It is quite possible, I think, that as this upper layer gradually dries up after the rains, damp air may rise, and if such air rising from such a soil is hurtful, the condition may be unsanitary. The spongy nature of the soil is not, however, easy to detect. The rain ceased this year on the 15th September, and to-day, 5 weeks later, dampness in the soil above rock level is barely perceptible. There is some slight dampness, as pointed out to the Sanitary Commissioner, this morning.

"The above remarks point, I would suggest, rather to the necessity for some system of sub-soil drainage than to a want of surface drainage.

"There is an entire absence of the coarser kind of grasses, which betoken a water-logged soil, and, as a matter of fact, Nasirabad is not water-logged. I have on record the spring level of no less than 137 wells, and the average spring level of these is upwards of 45 feet below the surface.

"I would hazard the opinion that if more attention be paid towards encouraging the growth of short herbage on the surface and to the cultivation of low standing crops, shrubs, garden produce, &c., all about the lines, much of the superabundant moisture would be absorbed and the quality of the atmosphere coming from any area so protected would be greatly improved. This is, in other words, a system of sub-soil drainage by means of the roots of plants."

I was unfortunately not able to visit this station until after the termination of the rains, and can therefore offer no opinion derived from personal observation; but it will be seen that there is a fall of at least 50 feet from north to south and one on east and west of about 40 feet, so that I should imagine the surface drainage was effective unless from temporary obstruction. The necessity for sub-soil drainage I perfectly concur in.

Climate.

There is no regular observatory at Nasirabad, but the meteorological conditions will be learnt from the following tables taken from Mr. Chambers' work on the Meteorology of the Bombay Presidency.

The monthly and annual mean temperature and the range between the greatest and least monthly mean are as follows:—

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual Mean.	Range between greatest and least Monthly Means.
58·9	70·0	72·1	85·3	93·8	91·7	85·4	83·8	83·8	80·8	73·8	65·4	78·7	34·9

The cold weather usually sets in the commencement of November, when the evenings and mornings are deliciously cool. It lasts generally until the end of March, when the hot season commences, and gradually increases in temperature until June or beginning of July, when the rains reach Nasirabad. The hot weather is described as most trying. The excessive temperature in the barracks is somewhat lowered by the use of tatties, punkahs, and in one ward of the hospital by a thermantidote; but even during the rains punkahs are necessary in the barracks and hospital, and their use is not abandoned until the end of October.

The general direction of the wind is shown in the next table:—

Direction.	N.	NNE.	NE.	ENE.	E.	ESE.	SE.	SSE.	S.	SSW.	SW.	WSW.	W.	WNW.	NW.	NNW.	Total.
April	...	7	10	3	1	...	...	...	1	13	12	29	14	23	5	2	120
May	1	3	24	3	1	...	9	...	2	5	48	34	55	22	34	7	248
June	1	1	21	4	3	6	7	...	...	3	31	27	75	29	32	...	240
July	1	...	17	...	4	...	7	...	1	...	68	...	77	...	73	...	248
August	...	...	4	...	3	...	2	...	...	...	46	...	46	...	23	...	124
September	...	2	9	6	...	11	3	...	...	8	19	14	22	17	8	1	120
October	6	7	7	1	2	1	...	2	7	14	21	23	15	12	6	124
November	1	17	17	22	1	2	1	...	...	16	7	16	2	4	12	2	120
December	2	12	40	24	1	11	2	...	1	10	4	2	1	8	3	3	124

During the cold season easterly winds prevail, but during the hot weather and rains the wind principally blows from a south-westerly direction.

The average monthly and annual rainfall for a period of 10 years at Nasirabad was as follows:—

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual Average.	Average of Monsoon Months from June to September.
·51	·00	·28	·08	·25	3·45	7·65	4·69	3·89	·25	·01	·00	21·06	19·68

On the average rain falls in every month, except February and December, and the monsoon is a light one. It usually commences in the end of June, the heaviest fall taking place in July.

Military Lines.

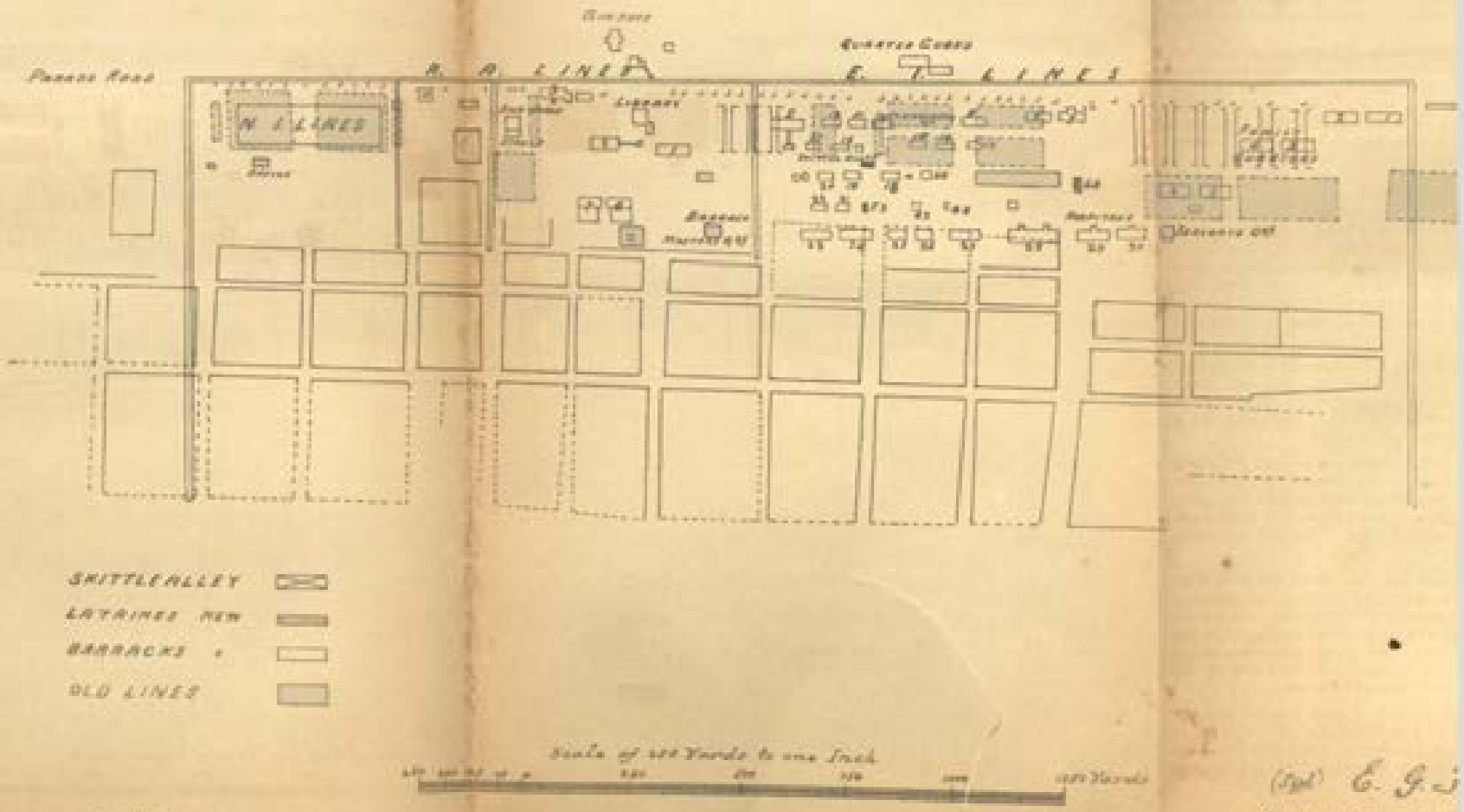
Two squadrons of Native Cavalry (1st Bombay Lancers) occupy the right of the line, and next to them, but further west, are the European Infantry Lines, where the head-quarters and 5 companies of the Worcestershire Regiment, late 29th Foot, are now quartered. It arrived in India on the 4th March 1879 and at Nasirabad from Mhow on the 25th November 1881.

BLOCK PLAN

SHEWING SITES OF OLD AND NEW BUILDINGS

IN THE

NUSSEERABAD CANTONMENT



B-397

(Sgd) E. G. J

ASSISTANT ENG

NUSSEERABAD

A Field Battery, M. 1 R. A., occupies the Artillery Lines. It arrived in India in September 1869 and at Nasirabad on the 28th March 1881 from Karáchi. On the south of the European Artillery and on the extreme left of the line are the pendalls of a Native Infantry Regiment, at present the 12th Bombay Native Infantry.

The accompanying tracing of the camp of Nasirabad as it was in 1851 and up to 1857, the year of the Mutiny, is most instructive, as it shows what was the condition of the camp in old days. This is the oldest map of the Cantonment that I have been able to find; but it must be remembered that Nasirabad has been a Cantonment since the year 1818 when General Ochterlony first established it, having come with a force to take over the district, Ajmere Marwarra, from Sindhia. But it will be noticed that the patcherries for the European Infantry have been built partly across the horse lines of the Native Cavalry Regiment and partly on the site of the huts in which the savárs were living when I belonged to the regiment and served here with them in 1858 and 1859.

The barracks of the European Infantry are on the site of the lines formerly occupied by a Native Regiment, and the Artillery occupy the site of the old Artillery Lines. As will be seen, a road extends along the front of the barracks, and some of the old bomb-proof buildings used as bells of arms are still standing, and show that the alignment of the front of camp in the old days remains unaltered. In my opinion a mistake of the most fatal nature was committed when it was determined to build European barracks at Nasirabad not to have advanced the line across the road on the west and not to have erected the barracks on a site which had never been occupied, instead of building them on sites which, to my own knowledge, were in parts filth-sodden by long previous occupation. If this had been done, and the sites they now occupy had been ploughed up and turned into gardens, a great danger, which it is now impossible to remedy, would have been averted.

The European Infantry Lines.

Commencing on the north are the blocks of married quarters. These are 6 in number, 2 being on the right of the line, the centre 2 being in echelon, and the remaining two still further in rear in echelon. As before stated, they occupy the site of the old Cavalry Lines, and the rows of trees which formed the horse lines are still standing, so that it is possible to fix the site very accurately. Four of the blocks contain quarters for 14 married men, but 2 have only quarters for 12 families. The blocks face west. They are built of stone, and stand on a plinth of an average height of 2½ feet.

The quarters are approached through arched verandahs 12 feet broad on the west and east, which, however, are not protected by sunshades. Each quarter consists of 2 rooms, the front one being 14′ long by 16′ broad and 16′ high, the bed-room being 14′ long by 10′ broad and 16′ high. This opens into a bath-room 7′ 6″ × 6′ which has been made in the rear verandah.

The means of ventilation provided besides the doors is a revolving fanlight over the doors and a window 4′ × 3′ opening into the verandah on the west. There is also a window of similar dimensions between the 2 rooms and a ventilating opening in the wall over the door leading into the bed-room, and a clerestory window also opens into the external air from each room. The roof consists of stone slabs.

In one of the blocks a new form of roof has been made, the stone flags being placed over tiles which afford an air cushion and allow of the expansion and contraction of the wood-work without disturbing the setting of the stone flags. On the north-east of the block on the north and on the south-east on the south end is a covered passage 40 feet long and 2 feet broad leading to a latrine with 3 seats where dry earth is used and which is intended to be used only by the women, the men using a separate privy in rear of the cook-rooms.

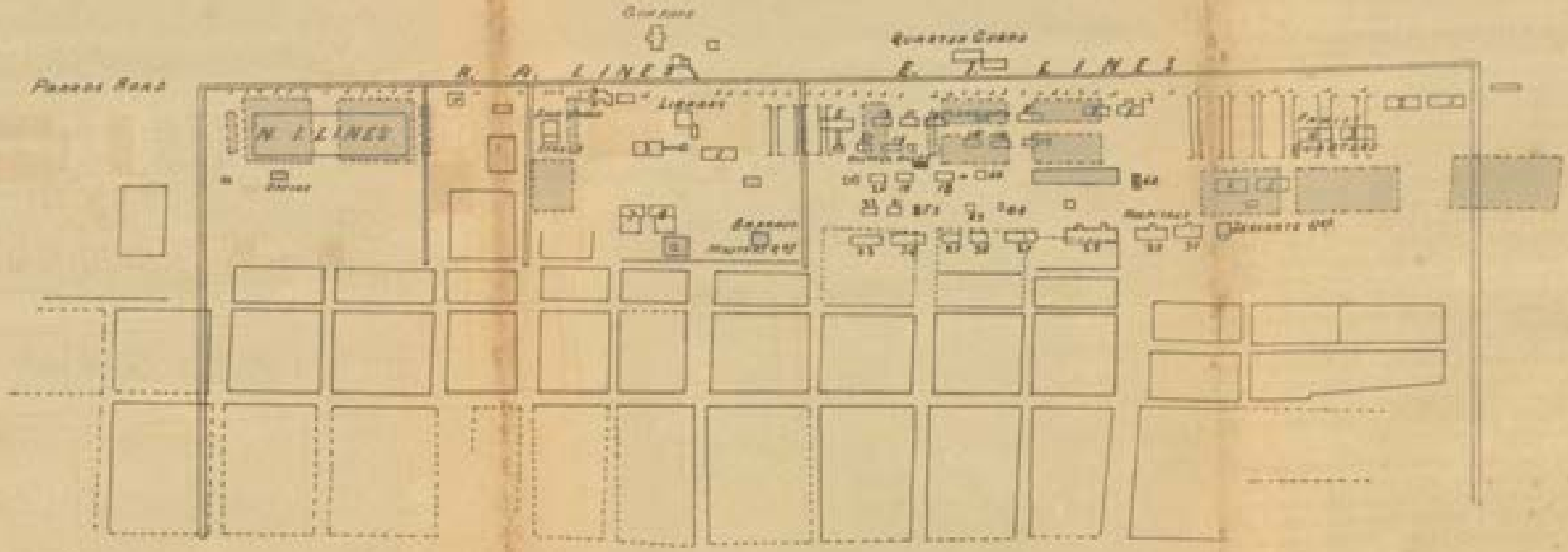
The cook-rooms are situated immediately in rear of each quarter and the liquid refuse is supposed to be received into an iron receptacle into which it is conducted through a stone spout; but in many instances it was found that the end of the spout did not come sufficiently over the receptacle, the consequence

BLOCK PLAN

SHEWING SITES OF OLD AND NEW BUILDINGS

IN THE

NUSSEERABAD CANTONMENT



SKITTLE ALLEY
LATRINES NEW
BARRACKS "
OLD LINES

Scale of 100 Yards to one Inch

(Sgd) E. G. F.
ASSISTANT ENGINEER
NUSSEERABAD S. Dn.

B-397

being that the ground below was found soaked with dirty water. A complaint was made that the chimneys smoke, the openings above being too small. I think they should be entirely uncovered at the top during the fine season, but covered with a cowl during the rains. It was also said that during the hot weather the flies, attracted by the contents of the receptacle, were a great nuisance. I would suggest that these receptacles be placed outside the east wall of the cook-room, a pipe being led along the north or south wall to end above the receptacle, which should be provided with a hinged top, and that gauze wire doors be fitted to each quarter on the east and west, which would add much to the comfort of the women. There is an enclosed unpaved space in front of the patcherries which is used for the deposit of dry sweepings, ashes, &c. This being to windward, is objectionable. The Regimental Bázár is to the east of Nos. 1 and 2 patcherries and about 150 yards from the north-east corner of No. 3 block. There are in it 18 houses, and it was not clean at the time of my inspection. The children are allowed to perform the offices of nature on the ground outside the houses, and a milkman keeps 5 buffaloes and 4 cows with their calves tethered in front of his house, the ground being fouled by their droppings. A dhobi also keeps 2 bullocks, and there are 5 or 6 regimental bhistis who keep their animals here, beside a stable belonging to one Ram Baksh, which was very filthy at the time of my inspection. Two tatties have been erected in the open behind the married quarters for the use of these natives, which also were very filthy. I think this bázár is much too near the married quarters and that it should be removed altogether as a source of danger to them; but in any case the tatties should be placed further east, and much greater cleanliness as regards the surface be observed. There is also a large garden immediately on the east of Nos. 3 and 4 blocks of patcherries. No. 4 patcherry was, I am informed, formerly recommended by the Medical Officer to be vacated on account of sickness among the women. It was in this building that a case of decided cholera and another suspicious case occurred this year. It will be also observed that blocks Nos. 5 and 6 stand on the site formerly occupied by the huts of the Cavalry. They are too immediately in front of the dead-house and of the old Cavalry Hospital now converted into quarters for the servants attached to the hospital.

The European Infantry Barracks.

These consist of no less than 21 buildings, excluding 2 upper-storied barracks which have been converted into a Station Hospital. It will be useful to state that, after the Mutiny, temporary thatched barracks were run up on this site, which up to that time had been occupied by Native Infantry pendalls. The ground was so filthy in 1858, when I was acting here as Staff Surgeon, that I reported it officially before the European Troops returned to this station after the campaign. Attempts were made to clean it then, but they were necessarily hurried, and the 83rd Regiment marched in and were located in the temporary barracks that had then been recently erected; but in the autumn of 1858, although coming off the campaign in perfect health, the men at once began to suffer, and continued to do so until I left the station in the beginning of 1859. The old thatched barracks, including those for the 8th Hussars on the north, were, I believe, 40 in number; but the present ones were begun in 1864, and 5 of them were erected in 1873 and 2 in 1874.

When it is remembered that for many years the site on which the barracks stand, was occupied by a Native Infantry Regiment in days when sanitation was not regarded, it must be allowed that the ground must have been very much polluted, especially as it is a sandy soil into which every impurity will readily sink and which experience teaches us is especially dangerous, as it will retain impurities for a long period which are liable to become, after being soaked with heavy rain, centres of disease. The present barracks stand in 5 rows and occupy an area of 854 yards long by 375 yards broad. On this space are congregated the barracks and subsidiary buildings, altogether amounting to 82 buildings. The barracks consist of different designs; 16 are single-storied tiled barracks and are designated quarter company barracks, which are intended to accommodate 12 men and a non-commissioned officer. Two of these are diverted to other purposes—one, No. 18, being used as a gymnasium and another, No. 26, as a Sergeants' Mess; 3 are half company barracks for 36

men, and 3 are double-storied barracks for 72 men. Commencing in the front row on the west from north to south are two half company slab-roofed barracks, Nos. 7 and 8. These were formerly double-storied, but the upper story was removed, as the walls were not strong enough to bear it. Next to these are 4 quarter company barracks with tiled roofs, Nos. 9, 10, 11 and 12, and an upper-storied barrack for a full company, No. 5 (the old Artillery Hospital),—total in front row 7 barracks. The plunge-bath is between Nos. 9 and 10 barracks. In the second row are 5 quarter company barracks, Nos. 13, 14, 15, 16 and 17,—total 5. In the third row, Nos. 18, 19, 20, quarter company barracks,—total 3, but No. 18 is used as a gymnasium. In this row is the old bomb-proof Native Infantry Hospital, No. 60, now used as a temperance hall and coffee shop, and No. 56, the Library; No. 55, the workshop; No. 54, the orderly-room; and latrine No. 64, which has 16 seats and is situated in rear of No. 7 barrack on the west, from which it is distant 375 feet. Hospital building, No. 30, is on the east at a distance of 335 feet from its south-west corner. It is also 192 feet distant from the orderly-room on the south-west and 142 feet from well No. 35, from which the water for the plunge-bath is drawn, and 192 feet from another well, No. 140, on the south-west, which also supplies the plunge-bath.

In the fourth row are 21 and 22 quarter company barracks,—total 2, and latrine No. 53 with 16 seats which is 98 feet from barrack No. 21 on the south, 163 feet from barrack No. 24, and 173 feet from barrack No. 25, which are in the 5th row on the east, 203 feet from No. 30, armourers' shop on the north-west, 209 feet from barrack 18, and 150 feet from barrack No. 19 in the third row on the west.

In the fifth row are 6 barracks. No. 23, formerly an upper-storied barrack, but the upper story has been removed. It is roofed with stone slabs, and is now a half company barrack for 36 men. No. 24, an upper-storied barrack for a full company, but the lower floor is used for stores. The roof consists of slab stones over tiles. No. 25 and No. 26 (Sergeants' Mess) quarter company barracks; No. 27, an upper-storied barrack for 72 men; No. 28, formerly an upper-storied barrack, but the upper story has been since removed. It can accommodate 72 men. Adjoining No. 28 are barracks No. 29, an upper-storied building, and barrack No. 30, with an upper story only over the south end. These two barracks are used as the Station Hospital. The following is the description of each pattern barrack:—

Quarter Company Barrack.

Number 9 is taken as the example. This barrack is built of stone, the roof is tiled, the height of plinth is 1·6 feet. It faces west, a verandah 10 feet broad extends all round the building which on the west side is entirely open, but on the north-east and south-east corners is enclosed to form a wash-house, outside of which is a tank-stand for the Danta water. On the east the verandah is enclosed. It is approached through 2 doors 7½′ high by 4′ broad. There are also 5 windows 5′×4′ in the external wall which have revolving glass shutters over them 4′×1′. From the verandahs on the west and east are seven arched openings leading into the dormitory which is a single room 73′ long by 24′ broad by 20′ high. Above each of these openings is a clerestory window communicating directly with the external air; a door also communicates with the verandah on the south side, and opposite it on the north side is another door leading into a room 8′×24′×20′, where the non-commissioned officer resides. This room has 2 windows looking into the north verandah, and there are also 4 clerestory windows over the doors and windows. A door opens into the east verandah where it has been enclosed to make a wash-house for the non-commissioned officer. The roof of the building is double-tiled and there is a continuous ridge ventilator. The rooms have a ceiling cloth in which openings have been cut. I think this should be removed, as it must impede ventilation. It has been found in many instances necessary to stop up the ridge ventilator to prevent rain beating in: the water from the wash-houses is allowed to soak into the ground around a tree.

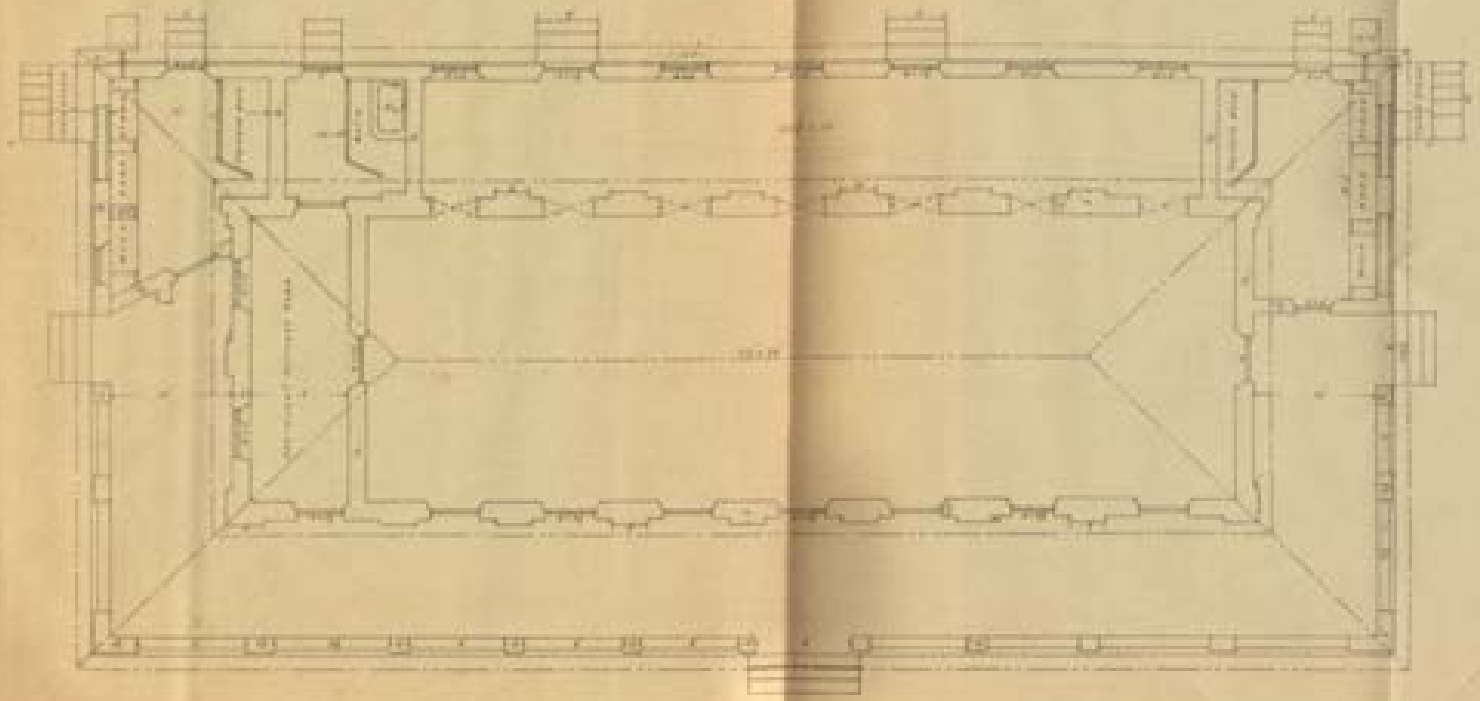
Barrack No. 28, Full Company One-storied Barrack.

This barrack was formerly an upper-storied barrack, but the upper story has been removed, as the lower walls would not bear it. It is a stone building

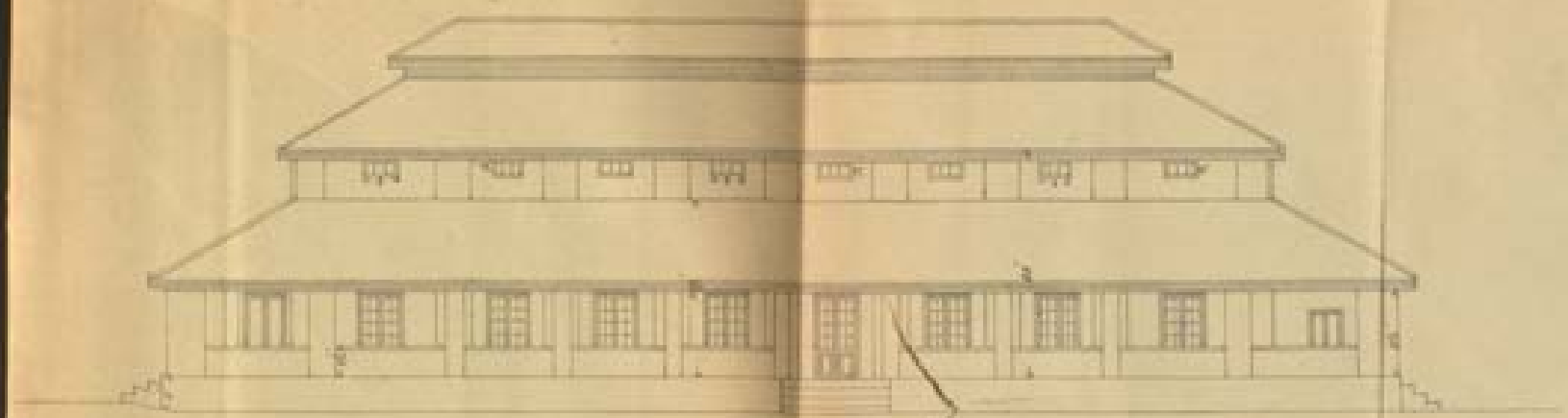
PLAN OF No. 9. QUARTER COMPANY BARRACK IN E.I. LINES

AT

NUSSEERABAD



FRONT ELEVATION



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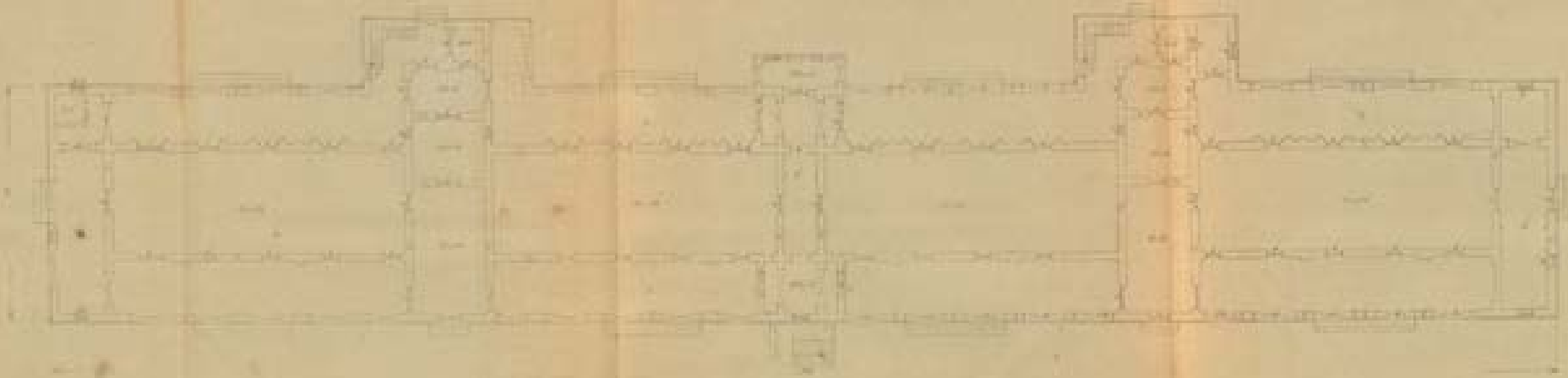
SCALE 10'-1 INCH

(Signed) C. G. Bey
Assistant Engineer

Plan of No 28 E. I. Barrack at Nusseerabad



Front Elevation

Scale 20 Inch

E. 777

standing in the fifth row next to the barracks used as a hospital. It can accommodate 72 men. It has a plinth of a height of 2·7′ and is surrounded by a chunamed gutter to catch the rain water falling from the roof; but this is discharged on to the ground in the immediate neighbourhood.

The roof is flat-terraced and consists of stone slabs. The barrack is approached through a verandah 12 feet broad, which extends on the east and west, but is divided by partition walls on the east. The arches of the verandah, both on the east and west, are protected by open stone slabs forming sunshades. The barrack is divided into 4 rooms separated from each other by partitions. It is flagged throughout with stone slabs. Room No. 1 for 18 men is 72′ long by 24′ broad by 16′ high. On either side of the dormitory are 5 doors. There are no fanlights over them as I think there should be. I noticed a smell of organic matter in the room. Besides the doors are two extraction shafts and only two clerestory windows on each side, beside 3 ventilating openings in the roof where the slabs have been removed and raised for the height of about 2 feet. In the end corner of the verandah is a space enclosed by a wall in which the chatties for drinking water are kept. This had better be removed, as it impedes ventilation. On the north end of the barrack room and approached from the east verandah is the dining-room 30′×18′×18′. In the north end of the west verandah opposite the dormitory the building projects to the west. In the corner are the stone stairs for the sweeper which formerly led to the bath-room of the Sergeant's room in the upper floor, and from the west verandah in continuation of the mess-room are the Sergeant's quarters consisting of two rooms, the sitting room 18′×10′×16′ has a door opening into the mess-room, and the bed-room of the same dimensions opens into a bath-room 8′ feet square. The ventilation of these rooms is imperfect, as the westerly breeze is impeded by the bath-room. Each room has clerestory windows. On the north end is a dormitory No. 2, 73′×24′×16′. The arrangements are exactly the same as room No. 1. A passage 24′×8′ broad divides the building into 2 wings. One room of smaller dimensions on the north side is intended for a school room, but is at present used for stores, and the remaining room of the same dimensions as No. 1 is now empty, as it is kept as an auxiliary ward for the hospital should it be required. In the centre of the building on the east, approached by a covered way, is the wash-house, the water from which is received into a large chunamed cistern, from which it flows into a garden alongside.

Barrack No. 27, Half Company Upper Story Barrack.

An upper-storied barrack on the south of and in the same line as barrack No. 28. On either end of the building on the west leading to the upper story is a stone staircase with very steep steps. It is intended for the sweeper, but is used by the men. The roof over the main building is provided with a continuous ridge ventilator and is covered with stone slabs, but the verandah roofs are terraced. It has a plinth of 2·2. The building is divided in the centre by the Sergeant's rooms which project on the west. On the east and west are verandahs 12 feet broad protected between the arches by sunshades. These are quite open in front of the dormitories both on the ground-floor and upper stories on the west side, but on the east at either end rooms have been made by enclosing the verandah. On the north end the rooms on the ground-floor were formerly used as a Sergeants' Mess. A Sergeant occupies a room on the north-east verandah 20′ × 12′ × 16′. It opens into the central passage on the north, and opposite it on the north-west corner of the verandah is a store-room. The old Sergeants' Mess consists of 2 rooms with an arched opening between, that on the north is 47½′ × 24′ × 16′ high, and is occuped by 10 men. This room has only one door on each side leading into the east and west verandahs. There are no revolving fanlights as I think there should be over these doors. There are no clerestory windows. There are two extraction shafts, one on either side of the rooms and two small ventilating openings on each side. There are two windows each 5′ × 3′ on each side. The ventilation in this room is imperfect, and a smell was noticed in it. The smaller room for 4 men is 24 feet square. There are only 3 windows in it and a door, which is locked, as it leads into a store-room on the east side. I think these rooms should not be occupied, if

possible, as the ventilation in them is imperfect. The Sergeant's quarters are in the centre of the building which projects to the west. The sitting room is 18′ × 14′ × 16′ high, the bed-room 18′ × 10′ × 16′ and the bath-room on the west verandah 8 feet square. I think it would have been better in all the barracks to have made the Sergeant's sitting room face the west and to have placed his bath-room on the east. The south wing on the ground floor is divided into 3 rooms; that on the south is 27½′ × 24′ × 16′ for 6 men. It has a door leading to the south verandah and another opposite to it leading to the adjoining room and 2 doors on either side. There are no revolving fanlights over the doors and no clerestory windows. There is one extraction shaft and a small ventilating opening over the door on the east side. The door on the north opens into a dining room 21′ × 24′ × 16′, and this communicates on the north with another room 21′ × 24′ × 16′ for 4 men. The ventilation in this room is only through the doors, of which there are 2. There are no revolving fanlights and no clerestory windows, but there is a small ventilating opening on either side. These rooms on the ground-floor were originally constructed as day rooms and were not intended to be used as dormitories. If they are to be used as such, I should recommend that the partition walls be taken down and one large room be made, and that means of ventilation be provided over the doors. I would suggest that this be effected by making a hinged glass window opening upwards, which would thus allow plenty of air to enter the room, but would direct the current upwards and not downwards on to the men's beds. The walls cannot be pierced to make clerestory windows. The upper story is approached by a stone staircase in the centre of the building opposite the Sergeant's quarters. There is a dormitory over the ground-floor in each wing which is 73′ long by 24′ broad by 20′ high and affords accommodation for 18 men. One door opens into the passage at the head of the stairs, and there is also a door opposite to it leading to the verandah and 3 doors 2 windows 5′ × 3′ and 5 clerestory windows on either side and one over each of the doors north and south. There is cloth ceiling with small openings in it. This I think should be removed, as it impedes ventilation. There are Sergeant's quarters of exactly the same dimensions (except that they are four feet higher) as the rooms on the ground floor. The wash-house is on the rear of the barrack, and the waste water is discharged on to a garden. The ablution water from the Sergeant's quarters is also led to trees.

No. 7, Half Company Barrack.

No. 7 and No. 8 half company barracks are, it will be remembered, on the extreme right of the front row. They adjoin one another, and are only separated from each other by a distance of 19 feet. They were formerly upper-storied. Each barrack consists of two wards for 18 men. The roofs consist of flat stone slabs. A 12-feet verandah with sunshades between the arches extends round each barrack. Each dormitory is 74′ long by 24′ broad by 16′ feet high. It has 5 doors on either side and 2 at the ends, one opening into the external air and the other into the mess-room 30′ × 18′, which is common to both rooms. There are no revolving fanlights over the doors, but small ventilators are inserted over each door. There are 3 clerestory windows in each ward and 2 extraction shafts. The Sergeant's quarters are on the west. They consist of 2 rooms, one 18′ × 14′ × 16′ and the other 18′ × 10′ × 16′, with a bath-room 8 feet square. The men say that during heavy rain the roofs leak. On the north-west side of No. 7 barrack and on the south-west side of No. 8 is a wash-house, the wastage water from which is led to trees.

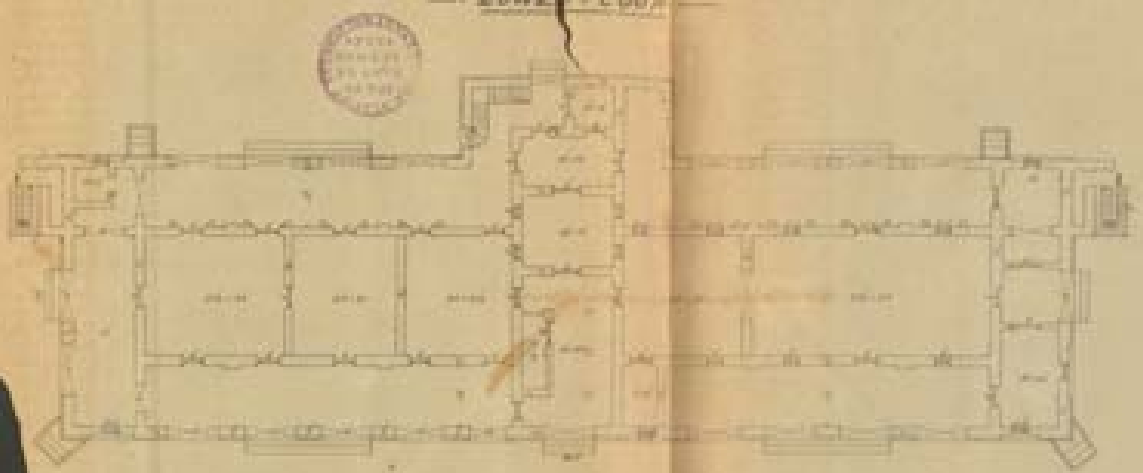
There are altogether 8 cook-rooms provided—

Nos. 66 and 67 for barracks	Nos. 7,	8, 9 and 13.
„ 49 and 50	„	28, 27 and 25.
„ 65	„	10, 11, 12, 15 and 16.
„ 60 and 63	„	17, 19, 21.
„ 44		Canteen and Sergeants' Mess.

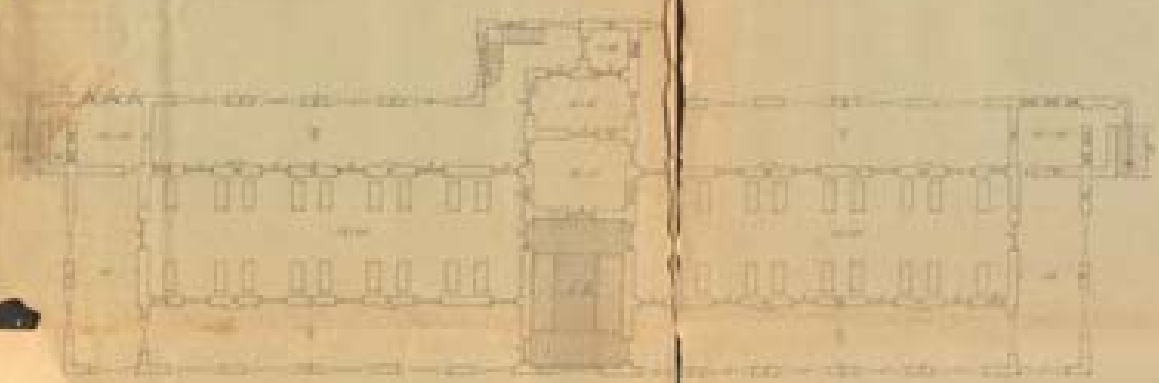
Barrack No. 5 (the old Artillery Hospital), Canteen and Sergeants' Mess have separate cook-rooms attached to them. The wastage water is removed by puckalee bhistis and the dry refuse by carts. There are only 2 latrines for the use of the men in the barracks, but No. 5 barrack has its separate latrine, and there is a urinal outside each barrack.

PLAN of No 27. E.I. BARRACK AT NUSSEERABAD

LOWER FLOOR

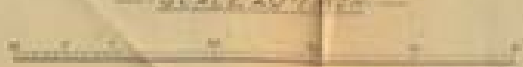


UPPER FLOOR



FRONT ELEVATION

SCALE 20 FEET



The European Infantry quarter-guard is situated on the west of the parade road. It is a stone building standing on a well-raised plinth of 2′ 5″. The quarters for the Provost Sergeant consist of 2 rooms and a bath-room in the south verandah, and there is a separate cook-room and latrine for him on the south of the building. Next to these quarters is a room 70½′ × 24′ × 20′ used for the storage of tents. The guard consists by day of 1 Sergeant, 1 Corporal and 9 Privates, but by night there are 12 Privates. The guard-room is 60′ × 24′ × 20′ and there are 4 doors with revolving fanlights over them and clerestory windows over the doors. The floor is paved. The verandah on each side is 10′ broad. On the north end of the guard-room is the prisoners' room 38½′ × 24′ × 20′. The wash-house is on the east approached by a covered passage, and the east verandah is prolonged so as to form the west verandah of the range of regimental cells, 10 in number : each cell has 130 square feet and a cubage of 2,210 cubic feet. Ventilation is effected through the barred door on the west, over which is a clerestory window, and there is a second clerestory window in the wall on the east side, whilst there is a small ventilator in the roof. A latrine of 6 seats projects on the north-east from the end of the block of cells. This was found to be very clean. On the west of the Lines are 5 Staff Sergeants' quarters which are very suitable buildings; each is surrounded by a small compound.

The Infantry barracks and lines at the very frequent inspections I made, were invariably found to be kept very clean. The latrines, at which dry earth is used, were always clean and inoffensive on near approach, though, I think, much freer ventilation is required in the back walls, which, in my opinion, should be open for at least 2 feet under the eaves. The urinals being on the standard plan are, in my opinion, objectionable. The best form of urinal is, I think, to have merely a roof supported by uprights between which bamboo battens extend for a height of 4 feet, leaving a clear air space of at least 2 feet between the top of the battens and the roof. In both latrines and urinals it would, in my opinion, be a great advantage to substitute dammered earthenware for iron vessels, as the latter, after a time, however carefully kept, emit an offensive odour, and particles of dirt cling to them which are not removed by ordinary cleaning. The former are so cheap that when they become offensive they could be replaced at a very moderate cost.

The Royal Artillery Lines.

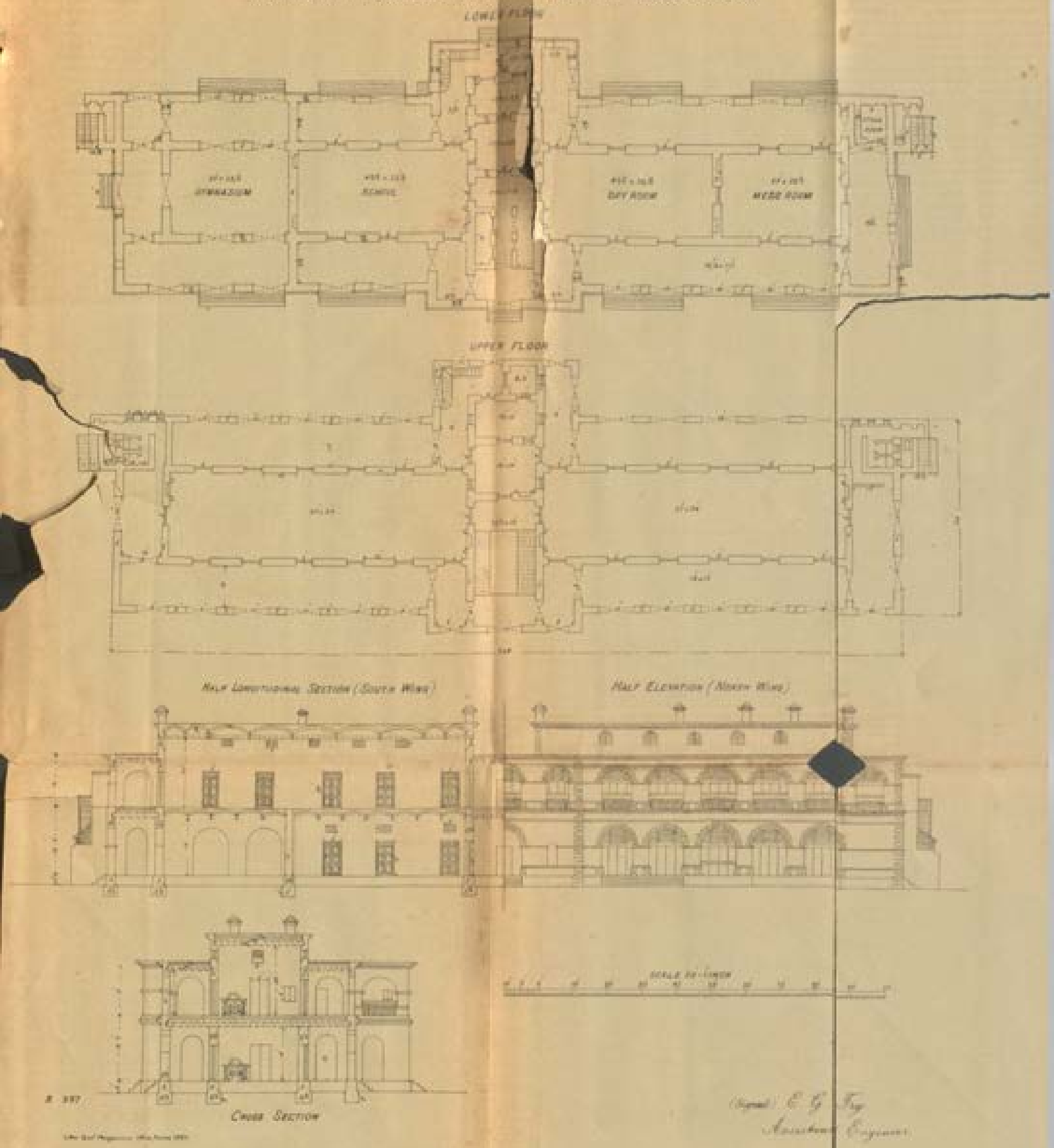
The Royal Artillery Lines are to the south of the European Infantry Regiment. The bakery in an enclosed compound, and behind it a block of buildings, used as Barrack Master's stores, separate the Artillery from the Infantry Lines. A Field Battery, the M. I R. A., at present occupies the barracks, which are 3 in number. Nos. 1 and 3 are upper-storied barracks which were erected in 1872-73, but No. 2 is one of the old Bengal Artillery barracks erected in 1823. The quarterguard and gun-shed are situated on the west of the road running in front of the camp. The quarter-guard is built of stone with a 12′ verandah on the east and west. The outer wall of these verandahs is arched. On the south side the verandah is enclosed, and forms 2 rooms and a bath-room for the Provost Sergeant. One room on the south-west corner is 15′×12′×14′, the centre room being 22′×12′×14′ and the bath-room 10′×12′. Adjoining it is a prisoners' room 16′×24′×20′, and next to this is the guard-room 30′×24′×20′. The means of ventilation provided is through the doors and clerestory windows. In the rear of the east verandah on the north end is a passage leading to the wash-house and further north in line with the east verandah of the guard-room are 3 cells. Each cell has a superficial area of 130 square feet and a cubic capacity of 2,210 cubic feet. There is a barred door on the west and a window with clerestory above on the east wall, besides an opening in the roof. At the north end of the cells is the privy with 3 seats. This is 192 feet distant from the Sergeant-Major's quarters which are situated on the eastern side of the road. It is well to record that the Sergeant-Major's wife died during the rains from choleraic diarrhœa, but no connection was traced between the disease and this privy, which, however, is directly to windward. On the south of the guard-room is a cook-house and privy for the use of the Provost Sergeant. On the east of the quarter-guard is an old building now used as the Library and formerly as a

Theatre. No. 1 and No. 2 barracks stand in line, No. 1 being on the north. This is one of the new upper-storied barracks. It is a stone building standing on a plinth of about 2 feet. The rooms on the ground floor are not used as dormitories. On the south end is the gymnasium, which is entirely open on three sides. On the north it adjoins the school-room, which is 49½′ long by 23½′ broad. This room has 3 doors with revolving fanlights over them and 5 very small clerestory windows under the ceiling, a large opening is made in the partition wall dividing it from the gymnasium, and there is a clerestory window over the door leading to the staircase in the centre of the building, besides extraction shafts leading up to the roof. On the west the barrack projects so, as to make room for quarters for a Sergeant. In the sitting room 17½′ × 13½′ × 18′ is a fireplace, the bed room is 17½′ × 9½′ and the bath-room 8 feet square: the stone staircase leading to the upper story divides the building into wings. In the north wing is the dining room, which is the same size as the school-room in the south wing, and on its north side is the temperance hall 35′ × 23½′. The upper story is approached by the staircase, the steps being of stone, but the landings are planked: this leads to the dormitories in the upper story, there being one in each wing. Each dormitory is 88′ long × 24′ × 20′, and is approached through a door from the landing opposite, which at either end is a door leading into the verandah on the south or north. In each room there are 5 doors with revolving fanlights over them on both east and west and 5 clerestory windows above them. The lower part of the doors is venetianed, the louvres opening upward. The floors of the verandahs on east, south and north are covered with flat tiles, but on the west are flagged, as is each dormitory. At each end of the western verandah is an enclosed place which was evidently intended for a privy, but which is not used as such, although a urinal tub is kept in it at night which is placed at the top of the sweeper's passage. I recommend that the partition wall at these corners be removed, as they answer no good purpose and impede ventilation and supervision. The roof is terraced. There are 5 arches in the verandahs opposite each dormitory and 2 arches on the north and south end of the building. The Sergeant's room between the 2 dormitories is of the same dimensions as the rooms below. The wastage water from these quarters falls into a cistern, and is led to trees. On the east of the barrack in the centre is the wash-house, where the usual arrangements are made. The wastage water flows into a cistern, where it is distributed to trees in the immediate vicinity. There is a urinal at either end outside the barrack on the east. The men use latrine $\frac{2}{3}^{A}$, which is common to Nos. 1 and 2 barracks.

No. 2 Barrack, erected in 1823.

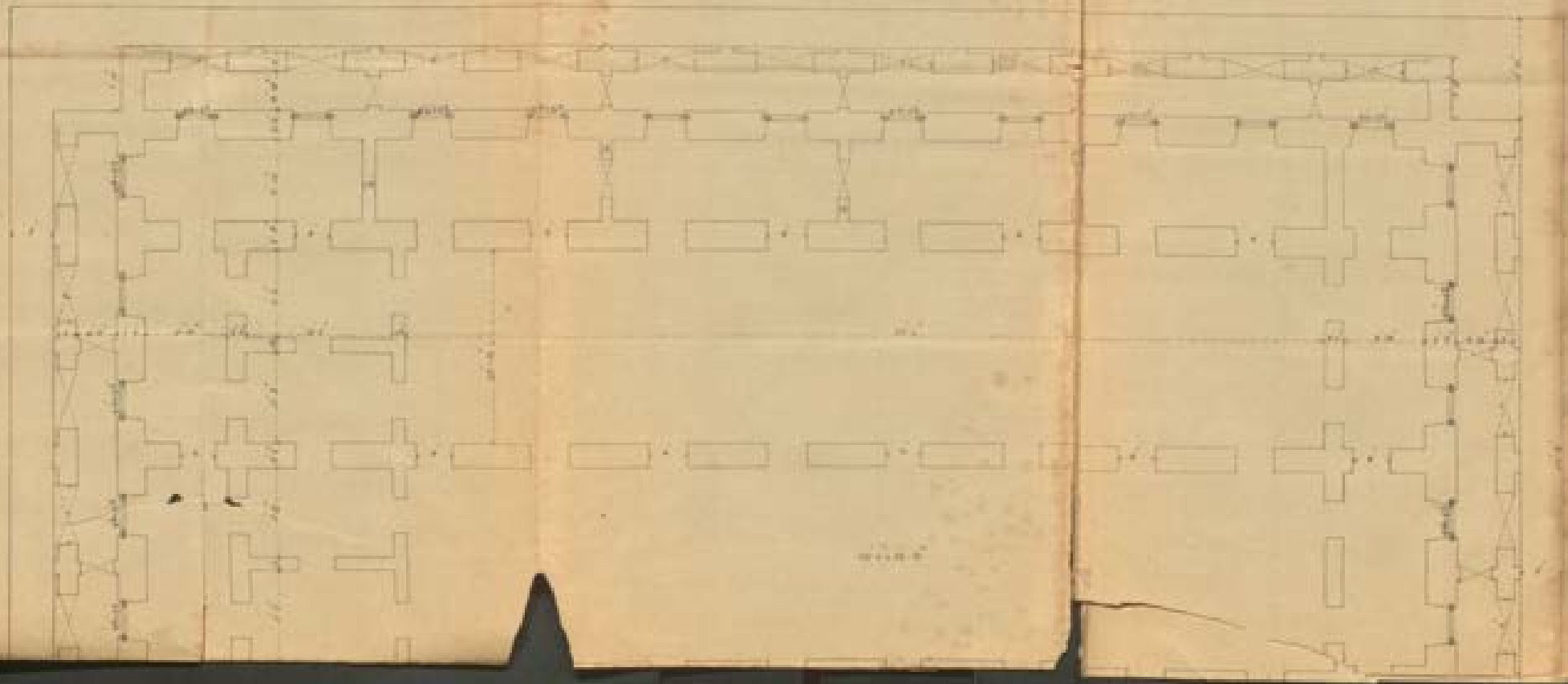
This barrack is of faulty construction, as it consists of 2 rooms extending longitudinally side by side and approached through an inner and outer verandah. The outer verandah was formerly arched, but the arches have been built up, so that only longitudinal openings are left. The outer verandah, 5 feet broad, leads to an inner verandah which is partitioned off into rooms. Through it the dormitory is reached. The 2 rooms, each 113′ long × 24′ × 18′ high, are divided by a partition wall in which 4 openings 4 feet wide extending from floor to ceiling have been made. There are 8 doors 6′ 8″ high by 4′ wide leading from each inner verandah into each dormitory, and over each door is a clerestory window. The 4 openings between the room have a ventilating iron grating communicating with the roof over them, and besides these 4 openings are 4 doors 6′ 8″ × 4′ between the dormitories. At either end of the barrack on north and south are rooms which are used as dining rooms, but on the south-east corner is a room used as a sleeping room. It is needless to say that the ventilation in these rooms, in each of which 32 men sleep, is very imperfect; and the men in the dormitory on the east say that during the hot weather the heat in that room, especially at night, is excessive. I think this barrack should be condemned, but if it is still to be used, much, I think, might be done to improve its condition. In the first place I think the outer verandahs should be removed altogether and the air avenues of the existing inner verandah largely increased by opening up the doors to the roof and by turning arches in the external wall and by placing large ventilating cowls at intervals in the roof. Then I think the opening of the doors between the inner verandah and the room should be prolonged up to the roof, and I would do away with the rooms at either end of

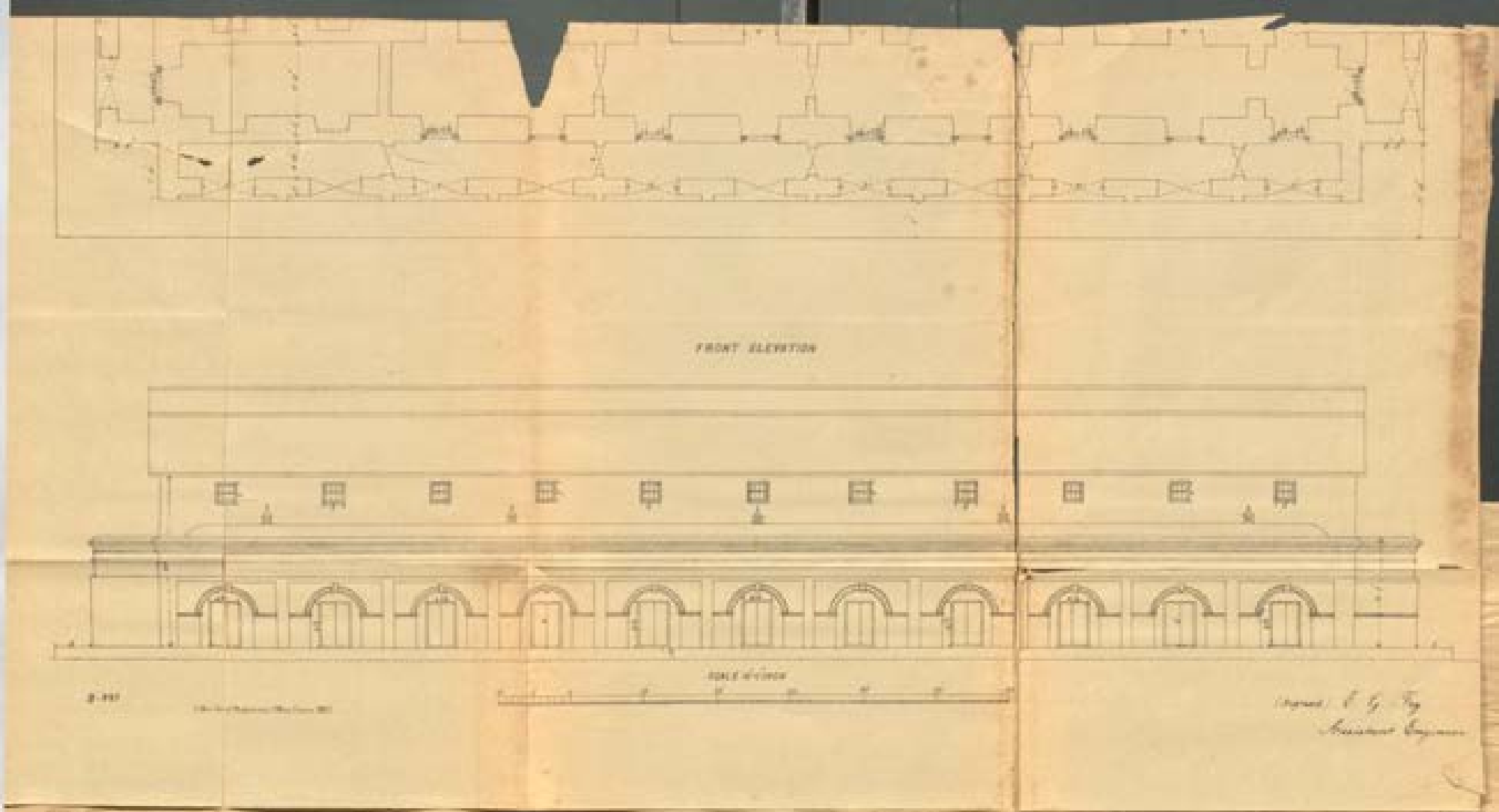
PLAN OF No. 1 ROYAL ARTILLERY BARRACK AT NUSSEERABAD



(Signed) E. G. Fry
Assistant Engineer

PLAN
OF No 2
ARTILLERY BARRACK
at
NUSSEERABAD




FRONT ELEVATION
SCALE 1/4" = 1 INCH

the barrack both on the north and south, and let the men dine in the verandah. An arch might possibly be turned in the north and south walls,—at all events, there should be direct communication here with the external air; but, as I said before, I think that this building, which has been in existence for 60 years, should be condemned. Immediately in the rear of this barrack is the Artillery garden, which is watered from a well close by, and it adjoins another garden into which the wastage water from the adjacent plunge-bath, which is filled from well No. 45, is led. On looking down this well the water is seen to be about 35 feet below, and the rock is met at about 3 feet below the sand which forms the surface. On the south side of this garden is a bomb-proof building in 2 compartments which forms the cook-room for Nos. 1 and 2 barracks.

On the north of No. 2 barrack, approached by a covered passage, is the wash-house, the wastage water from which is led to trees.

No. 3 barrack is one of the new upper-storied barracks and is on the south-west of the other buildings and very close to the road passing in front of the camp. This building is similar in all essentials to No. 1 barrack. It is built of stone and paved throughout with stone flags. The plinth is on the west about 2½ feet above the ground, but on the east only about 1 foot. The verandahs on east and west are arched and provided with sunshades. On the ground floor on the south is the Sergeants' Mess. The dining room is formed by enclosing the verandah on the south-east corner. In this the mess waiter sleeps. In the south-west corner of the verandah is the pantry. The next room is used for Quarter Master's stores; then comes the orderly room and Quarter Master's offices. In the north wing on the ground floor is the dining room 50′×24′, and north of this is the coffee shop. A Sergeant's quarter, consisting of two rooms 18′×14′ and bed-room 18′×10′ with bath-room 8′ square, projects in the centre of the building on the west, and opposite this on the east is the stone staircase leading to the upper floor. In each wing is a dormitory 88′ long by 24′ broad by 20′ high for 22 men. On each side of this room are 6 doors with revolving fanlights over them leading into the 12′ verandah on the east and west and on the north or south, as the case may be. There are also clerestory windows over each door. The roof is terraced, but is said to leak. A urinal tub is kept at the head of the sweeper's staircase. The Macnamara filter tub is placed on a raised chunamed platform, which drains out into the side of the barrack. The building is an excellent one, but I think some measures should be taken in this and around all barracks to provide eave-gutters and downtakes which should discharge the rain water into a paved drain, so that it might be led away for some distance from the barracks. The latrine for the use of No. 3 is on the south-east, No. 2/7. Dry earth is used, and it was very clean. An urinal is also on the south-east. The wash-house is on the north-east of the barracks, the wastage water being led to trees.

There are 2 blocks of patcherries, Nos. 6 and 7. In No. 6 there are 10 quarters; in No. 7 nine. The patcherries are to the east of the Artillery garden. They are stone buildings standing on a plinth of about 2 feet and have an arched verandah 12 feet broad on the west. There are no sunshades. Each building has terraced roofs over tiles. In No. 6 are 2 double quarters for married Sergeants at the south end. In No. 7 are also 2 double quarters, one on the north and the other at the south end. The single quarters consist of 2 rooms, a sitting room and bed-room with a bath-room which is built in the east verandah. The sitting-room is 16′×14′×16′, so that the superficial area is 224 square feet and the cubage 3,584 feet. Besides the door the means of ventilation provided is a revolving fanlight over it and a clerestory window higher up. There is also a window 4′×3′. Between the bed-room and sitting-room is an opening in the wall over the door and there is a window between the 2 rooms. The bed-room is 14′×10′×16′ and the bath-room 7½′×6′. The cook-rooms are built just behind each quarter. The women complain that the chimneys smoke: the liquid refuse is conducted from the sink through a stone spout under which an iron receptacle stands; but the refuse water frequently does not fall into it, and the ground below is soaked with offensive matter. The women, as in the Infantry patcherries, say that these receptacles attract an innumerable number of flies during the hot weather. I think that these

receptacles might be placed further away on the outside of the east wall, and their tops provided with a hinged cover. This water is removed by halalcore bhistis. The dry refuse is carted away. As in the Infantry patcherries I recommend gauze wire doors to keep out the flies. The canteen is in rear of the Veterinary Hospital. The only point I need mention in this building is that the room for the non-commissioned officers is much too small for health. It is only 12′ × 14′, and it may be used at one time by 18 men. An addition to it could easily be made, and it would add much to the comfort and health of the men if this were done, as in its present state during the hot weather the atmosphere of the room when full of non-commissioned officers cannot fail to act prejudicially on their health. The horse stables are three tiled buildings, open at the sides with a central passage between each row of horses, and are on the same line but further south than the Veterinary Hospital. The horses stand in each stable in rows on each side of the central passage. I noticed a strong smell of ammonia in these stables, as all the urine soaks into the ground. During the hot weather the horses are kept outside. In rear of these is a most objectionable row of huts where the bázár dealers live. The huts are, it is said, private property, and it is difficult to remove them; but I think they should be bought up and pulled down, as they are, in my opinion, likely to prove a nuisance. On the south of the stables are 4 tiled challs in which the Battery syces live with their families, and still further south is a chall for the accommodation of the gun lascars. These lines are kept as clean as they can be, but these people are put to the greatest inconvenience on account of there being no latrine accommodation for them. Formerly there was on the east a latrine on the standard plan, and recently an iron Crawford pattern latrine was erected for their use; but the owner of a house, which is situated 374 feet from the Crawford's latrine and 439 feet from the old latrine, has threatened legal proceedings if these places are used. The consequence being that these poor people are now forced to go long distances to relieve the calls of nature. The women have to resort to tatties near the railway and the men for nearly, if not fully, ¼th a mile to tatties which have been erected on the south-west of the Native Infantry Lines, to the residents of which during the monsoon they are not unlikely to prove a nuisance. The consequence being that the lines are fouled during the night, whilst many of these people use the servants' privies of bangalows in the vicinity. I think some arrangement should be made for them, and recommend the erection of a Goodfellow's latrine in which the ashes of burnt litter should be used. The horse litter is deposited on the ground behind the stables close to which 7 Battery bullocks are picketted. It is sold to a contractor, and I fear is used for fodder of cattle in the bázár; and in my opinion much of the nuisance complained of from the native latrine emanates from this litter and from the stables themselves. I have been disagreeably affected by the smell whilst passing along the public road on the south. I think it would be well if this litter were either burnt on the spot or immediately carted away.

The Station Hospital is established in barracks Nos. 29 and 30 on the extreme right (north) of the 5th row of barracks in the European Infantry Lines. No. 29 is an upper-storied building built of stone. It adjoins barrack No. 28, but since it has formed part of the Station Hospital, has been enclosed in a compound wall which includes the two barracks, servants' quarters, dead-house, &c. It stands on a well-raised plinth of 2′ 9″, and a 12 feet verandah protected by sunshades extends on the east and west. On the south side this has been enclosed so as to form store-rooms. The building is in 2 wings, divided in the centre by quarters for a Sergeant (now occupied by a medical subordinate) on the west and the stone staircase on the east leading to the upper story. On the south end of the ground floor are 2 wards. The one furthest south is 31′ × 24′ × 16′ for 7 patients. This room has two doors on either side and a door on the north and south. There are no revolving fanlights over them, and only one clerestory window and an extraction shaft on each side of the room. The second ward is 41′ × 24′ × 16′ for 9 patients. It has 3 doors on the east and also on the west, 1 clerestory window on each side, and 1 over the door on the north. There are no fanlights over the doors, which are panelled below with glass panes above. The Sergeant's quarters on the west consist of a sitting room 18′ × 14′ × 16′, a bed-room 18′ × 10′, and a bath-room 8 feet square. On the

north are the dispensary and office. The upper story is approached by a stone staircase, the landings being planked. The arches of the verandah on the east have sliding venetians, and below them are canvas doors to keep out the morning sun. The wards extend the length of each wing, and are respectively 74′ × 24′ × 20′. Each ward is intended for the accommodation of 16 patients. The floors are paved. In each ward there are 5 doors on each side and a door leading into the north or south verandah, besides one leading to the landing. There are revolving fanlights and higher up a clerestory window over each door. In the corners of the western verandah at either end is an enclosed place intended for, but not used as, a privy, to which a sweeper's staircase leads from the outside of either end of the building. I think the partition walls should be removed. And at either end of the verandah on the east side is a masonry sink from which the water used in the washing of basins, &c., flows through a tin-pipe to a masonry down-take, and is discharged into a receptacle below. The hospital writer occupies the Sergeant's quarters on the west of the upper story. The Macnamara filter for the use of the patients is kept in the north verandah on the ground floor, and water from it is brought in chatties for the use of the patients upstairs. There is a continuous ventilator along the ridge over the main building, and the roof over it consists of stone slabs; but the roof over the verandahs is terraced and cemented, but is said to leak. There is a urinal on the standard plan near the south-east corner of the building for the patients in the wards on the ground floor and in the east between the 2 barracks, and approached from each by a covered passage is the wash-house and latrine, both of which are under one roof: the water from the wash-house runs to trees.

Hospital barrack No. 30 is contiguous to, but further south of, barrack No. 29, from which it is separated by a space of 60 feet. It is likewise a stone building, but has only an upper story over the south end. It stands on a well-raised plinth of 2′ 5″. It contains 3 wards on the south end; that furthest south is 27½′ × 24′ × 16′, in which 4 beds are placed. The door on the south is permanently closed, as a thermantidote has been fixed in it. There is only one door and a window 5′ × 3′ and one clerestory window and an extraction shaft on each side of the ward. There are no fanlights over the doors. The middle ward is 21′ × 24′ × 16′ for 4 beds. The ward has only one door on each side. The doors on the north and south communicate with the adjoining wards. There is only one clerestory window and one extraction shaft on each side, but there are no revolving fanlights over the doors. The third ward is 21½′ × 24′ × 16′ for 4 beds. This ward has 2 doors on the east and 2 on the west, but there are no fanlights over them. There is a clerestory window over each side, but no extraction shaft. There are doors on the north and south; the latter communicates with the adjoining room, and the former is kept shut, as it divides the building from that portion used as a female hospital. The matron occupies the Sergeant's quarters on the west. The female hospital consists of 2 wards, one for 10 patients and the smaller for 4. This latter is the lying-in-ward, and is 22½′ × 24′ × 16′. It has 2 doors on each side, but no fanlight: it has 2 clerestory windows over the doors; that furthest north being on each side divided into 2 small windows. A bath-room has been formed on the east verandah of the ward, which is approached through the door on that side. The larger ward is 49′ × 24′ × 16′. It has 2 doors on the east and 2 on the west, a window 3′ × 4′ on each side between them. There are clerestory windows over each door. The women's latrine is on the north-east corner of the building. In the upper story the ward over the south wing is 73′ × 24′ × 20′. The floor of this ward is cemented, but the verandahs are paved. There are 3 doors on each side and a window 3′ × 4′ on either end of the east and west side. There are revolving fanlights over each door and 5 clerestory windows on each side. The space between the arches in the eastern verandahs of this building are not provided as in No. 29 with canvas doors, but the arches have wooden sunshades. In the south-west corner of the building is a sweeper's staircase leading to the verandah on the upper story where there is an enclosed space intended for, but not used, as a privy. I recommend the partition walls be removed. The roof over the south wing is the same as in No. 29, but over the north wing on the ground floor is terraced. The 3 raised ventilators in the centre of the wards below open here. The Apothecary and the Assistant Apothecary are provided with quarters in No. 6 patcherry.

The old bomb-proof Cavalry Hospital has been converted into quarters for the use of servants attached to the hospital, and beyond it is the dead-house. On the north-east side of the old hospital is the purveyor's store-room, &c. The hospital has accommodation for 70 male patients and 15 women; but it will be remembered that the north end of the adjoining barrack No. 28 is kept for use when required.

In my opinion a new Station Hospital should be provided, and these buildings revert to the original purpose for which they were constructed, *viz.*, barracks; but in any case the ventilation of the ground floor rooms should be improved. In No. 30 I recommend the partition walls being removed and one large ward made; at present the ventilation in the 3 small rooms is most imperfect. The necessity for a contagious disease ward has been strongly insisted upon by Surgeon-Major Chapman, and I entirely agree with him on this point. If a new Station Hospital is built, I would urge the absolute importance of building it on a raised basement, at least 3 feet high, so that all communication with the soil may be cut off and a free current of air be provided under the building.

The garrison cells, situated behind the church on the east of camp on the Ajmere road, are near the Mission House and about a quarter of a mile to the north of the Sadar Bázár. They stand in the centre of a walled courtyard. The building is 140 feet in length and has a plinth of 1foot: a verandah 10 feet broad extends in front and rear of the cells on the east and west. The doors leading into the cells are on the east. This is, in my opinion, a mistake, as more ventilation is required on the west side. Each cell is 15′ 9″ long by 10′ broad by 15′ high. The floors are paved with stone; in the west wall there is a window 4′ × 3′ opposite the door. Formerly the roof consisted of stone slabs, but in 1866 a tiled roof was put on with a ridge ventilator and the verandahs were covered with a tiled lean to roof. The stone slabs over each cell were not, as I think they should have been, removed when the tiled roof was put on, but there are 4 very small ventilating holes cut in them. In my opinion these stone slabs should be removed altogether, or these openings should be made very much larger. The latrine and urinal is on the south-east side and the wash-house on the north. A Macnamara filter has been lately provided, but is not as yet fixed. Up to this time the drinking water has been placed in 3 garrahs. Quarters for an Assistant Provost Sergeant and a store-room are on the north-west of the cells. Outside the walled enclosure are the Provost Sergeant's quarters on the south and the guard-room on the north end of the enclosure wall. The guard consists of a corporal and 6 privates. The room is 30′ × 14′ × 15′ and has a verandah of 6 feet on east and west. There is a door on the east and west wall and also 2 windows 5′ × 3′ on each side, besides 5 clerestory windows over the windows and door on each side. The roof is terraced: a privy and cook-house are provided.

The Lock Hospital is situated on the north of the Sadar Bázár in a space enclosed by a high wall, the west side of which has a lean to roof which forms one ward for 11 and another for 4 patients, besides the matron's quarters.

There are only 32 women on the register, as the Act is enforced only against those women who associate with European soldiers. During 1881 there were 83 admissions into hospital for the following diseases:—

Syphilis, Primary.	Excoriation.	Fistula of Labia.	Leucorhœa.	Simple Ulcer.	Ulcer of Os Uteri.	Total.
12	14	3	47	5	2	83

against 125 in 1880.

The women are examined once a week, and only 4 cases of non-attendance took place during the year. The admissions into hospital from venereal diseases amongst European and Native troops during each month of the year were as follows:—

Corps.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
E. B. 2 Brigade, R.A. ...	1	1	1	6	4	4	7	5	3	3	1	...	36
2nd Battalion, Leicestershire Regiment	13	10	18	11	8	13	7	9	3	8	8	...	108
1st Battalion, Worcestershire Regiment	...	...	...	...	...	...	...	...	...	...	...	11	11
2 P. W. O. Grenadiers ...	1	...	1	...	...	2	...	1	...	...	...	...	5
Squadron, 1st Lancers... ...	...	...	...	...	...	...	...	...	...	1	1	...	2
	15	11	20	17	12	19	14	15	6	12	10	11	162

Amongst European troops the admissions in 1881 were 155 against 195 in 1880. Fourteen cases were reported as contracted out of the station. The area over which the rules are in force is stated to be 8 square miles within the Cantonment and for 4 miles from the Cantonment boundary pillars. The Medical Officers suggest that the registered women should be housed somewhere in one quarter of the Sadar Bázár, and that the provisions of the Act should apply to all prostitutes, as much disease is contracted from women not on the register. I quite concur with them. It is such half measures which bring the results of the working of the Act into disrepute. It would, in my opinion, be wiser for the Cantonment Committee to save the large annual expenditure incurred for working the Act, amounting to Rs. 2,268-11-7, unless it is really made to apply *to all* prostitutes in the large native town of Nasirabad; and I think Regimental and Cantonment Police should exercise greater supervision in preventing illict prostitution on the confines of the Cantonment.

Water-supply.

The present sources of drinking water supplied to European troops at this station are from the Dilwarra and General Phayre's wells. The former is at a distance of nearly 2 miles on the north-east of the barracks, and is situated on the Agra road about half way between, and about 3 furlongs distant from, the village Dilwarra on the south and Dilwarree on the north. The well belongs to the village community of Dilwarra, and the Cantonment Committee pays an annual sum of Rs. 58 for the privilege of drawing water from it. On the west side of the road opposite the well is a tank embankment which retains water until about December, when it dries up. The water of the well is used by the villagers for domestic purposes and for irrigating the fields alongside which are manured. It is quite open, and though a policeman is kept on the spot to prevent persons passing along the road from drawing water, he is only present during such time as the water carts are being filled. A tree is growing out of the wall of the well into which the leaves fall. The water for the troops is drawn by bhistis in leathern mussucks which are emptied into a tin funnel connected with an iron pipe which conveys the water to the mule carts standing on the road. The same arrangement, except that the water is carried by camels, is made at General Phayre's well, which is about 2 miles from the barracks on the west in an open place and about a mile and a quarter from the village of Rajosi and the same distance from the village of Baloti where there is a tank. For the regiment eight cart-loads and eight camel-loads are brought daily. Of these 4 cart-loads always go to the married quarters, and the rest is distributed through the barracks. On a rough estimate a cart-load is equal to about 2 camel-loads, so that, excluding the married quarters, about an equal amount from each source is daily supplied to the barracks; but the water from each source is not kept separate, so that it must be often mixed in the filter tubs. A sodawater machine is maintained by the regiment, and the most scrupulous cleanliness is observed in every process of the manufacture of aerated waters which are supplied at a very moderate cost to the men. The water obtained direct from the Dilwarra well is very carefully filtered and strained, so that no dust can get into it, and the men much appreciate the great boon that is afforded them. The Danta water, which is laid on to the cook-houses for washing purposes only and to the wash-houses, is not at present used for drinking by the European troops.

I am indebted to Major Murray for the following extremely valuable notes on the subject of water-supply to this station:—

Population. The population, according to the last census of 1881, was 19,100:

Europeans	1,100
Natives (including troops)	18,000
Total ...	19,100

The animals are estimated to number (including cows, sheep, horses, camels, &c.) 4,500. Beyond a few dyers there are no trades demanding a special water-supply.

Original proposals for supply. A tank was originally contemplated at Rajosi, a village due west of and about 3 miles from camp. The scheme was rejected—

1st, because the supply was deficient.

2nd, because a large village is situated in the catchment close to the storage basin.

The Rajosi Project. A dam has since been constructed at Rajosi as an irrigation work; the supply is better than was anticipated, and there is a surplus generally on 1st April when irrigation has ceased.

It has been suggested that pipes be laid on to bring in some of the surplus for use in gardens at Nasirabad. The cost would be Rs. 12,000. It may be somewhat difficult, however, to come to satisfactory terms with the villagers who have preference claims to the water.

Other proposals. In 1868-69 the Government of India considered various other proposals, and eventually the Danta Project was sanctioned. This consisted of an impounding reservoir to hold 58 million cubic feet, to be formed by

Danta Project. the construction of a dam of masonry across a gorge in the Aravalli Hills, 5 miles north of camp.

Catchment ... ... 2¼ square miles.

Catchment. There are no villages, and grazing is not allowed on the catchment area of the impounding basin—

Depth of dam to weir level	33·25 feet.
Rainfall: Actual of 4 years, 1878 to 1881 =	65·66 inches
Average	16·16 yearly.
Supply. Average quantity stored in one year.	17·2 million cubic feet.
Proportion stored to rainfall registered ...	1 to 6
Loss from all causes: Actual of 4 years ...	19¼ million cubic feet.
Average supply yearly available for consumption	4·25 million cubic feet.
Over (1878 to 81 =) 4 years.	

Details. Eight-inch cast-iron mains (dipped in Smith's solution) with turned and bored joints lead the water into Cantonments.

4" and 3" sub-mains are the chief distributaries.

2" to ¾" wrought-iron feed-pipes are laid on to all principal buildings.

Water is drawn off—

1st.—At the Native Cavalry Hospital, near to which a stand-pipe is provided.

2nd.—At the Native Cavalry Lines where the horse trough is fed, 2 of Kennedy's pillar posts furnish water to the natives in the lines who have used it for all purposes for about 12 months.

3rd.—Pipes are laid on to European Infantry family blocks Nos. 1 to 6; but as the fittings have not been fixed, no water is drawn.

Filters. To the east of and between family blocks 5 and 6 there is a storage tank of masonry. This is water-tight and nearly air-tight; ¾" is used for filtering arrangements; the filtering materials consist of sharp clean sand in layers of varying size from fine to broken quartz 2½" cubic; total thickness of filtering materials about 5 feet. This tank contains, when full, about 64,000 cubic feet. The water is drawn off from a rectangular well 4 feet deep at one end of the tank by 4" cast-iron pipes, and is thence laid on to all the Military buildings south of this tank to the Royal Artillery horse trough and to the Native Infantry Lines,—all of which are thus supplied with filtered water.

The feed-pipes run to every building, but some of the fittings have not been fixed. Stand-posts and hydrants are set up at convenient intervals throughout the lines, but the full complement is incomplete as regards officers' houses; no pipes have as yet been laid on to the bazár.

Present state.

As matters stand on this date the scheme is not in full working order.

This is due partly to a deficiency in supply and partly to doubt as to the absolute purity of the water, as noted further on.

The original sanction was nominally placed at 3 lákhs, including bázár arrangements. The actual expenditure to date has been—

On dam and head-works ...	... Rs.	79,856
On mains, distribution pipes and fittings	.. „	1,53,010
On filters, filter tank and storage tank	... „	9,789
Total	... Rs.	2,42,655

Extension sanctioned.

The Commander-in-Chief has lately sanctioned an extension of the supply by connecting the Danta mains with the Bir dam, and when this is done, the supply will, it is estimated, be sufficient for all purposes, both for the troops and for the bázár or native town.

Bir Tank.

The Bir tank is formed by a masonry dam across the outlet of a catchment of some 10 square miles east of and contiguous to the Danta catchment and with which its sanitary conditions are almost identical.

The water was analysed and pronounced excellent some years ago when the Bir scheme was among those proposed as a source of supply. It is to be regretted that such a satisfactory source was ever resigned.

However, the villagers, as at Rajosi, hold istamrar (jaghire) land and thus difficulties arose from which the Danta Project was free, and as the latter promised fairly to meet requirements, the Bir tank came to be abandoned, although since constructed as an irrigation work.

The Bir tank details are not fully to hand in this office, but the following will suffice for the Sanitary Commissioner's purposes :—

Depth above sluice to weir level ...	...	34 feet.
Average annual supply	...	56 million cubic feet.
Average demand for irrigation until arrangements can be come to with villagers ...	...	15 ditto.
Vertical fall in water level from absorption, evaporation, &c., in 12 months	...	8 feet.

Details connected with Bir Extension Scheme.

The extension has two objects in view : *1st*, to complete the supply for the troops and placing this beyond all doubt.

The distance between the Bir outlet and the Danta main junction is 3 miles ; the connection will be by 5" cast-iron pipes.

A second storage tank with filter will be constructed at the highest point in camp to contain 70,000 cubic feet. Hence the total supply will be 134,000 cubic feet.

At present something under 1,900 gallons or 304 cubic feet are daily brought into camp by mule carts and camel puckals. This is called the sweet water or potable water-supply for the garrison : the sources are—

1. Dilwarra well.
2. Phayre's well.

Of this very small supply 500 gallons were intended for Natives and the balance for Europeans :

The Europeans number roughly... ...	...	800
The Natives	...	1,600
Total	...	2,400

The Native is essentially a water drinker. The European is a partial consumer, and yet the European is supplied with nearly 2 gallons a head and the Native with only ¼th gallon. As a matter of fact it may be stated that the so-called potable water-supply is a farce and always has been so.

At the present time of all the water from Phayre's well and Dilwarra little or none goes to the Natives, except perhaps to the hospitals. All or nearly all drink the Danta water.

The consumption has been accurately tested for some months past, and is now put at 2,000 cubic feet a day for all purposes ; but if 3,000 cubic feet be allowed for, the reserve is sufficient for 45 days, and it will, on the completion of this scheme, be doubly filtered before passing into the distribution pipes.

The Sanitary Commissioner has personally tasted and examined Danta water drawn from the ablution tanks in quarter company European barracks only once filtered; he has tasted the same after it passed through a carbide filter cart and also after it had passed through a Macnamara filter, and analysis after a second primary filtering would doubtless give yet better results.

Tank water cannot well be over-filtered, and if expense were out of consideration, a third storage and filter tank would be of advantage.

Bázár supply. 2nd.—To arrange for a supply for the bázár.

The Military pipes will of course be used, but additional storage and filter tanks are desirable. One tank at least to hold a week's supply is necessary in case of a stoppage in the main. It is obvious that no water-supply scheme is complete without this precaution,—at any rate not in this country.

The expenses to be incurred on the bázár scheme may amount to Rs. 30,000 and upwards, but this need not be entered into. The Cantonment Fund now draws a large income from the octroi tax, and can afford any sum that may in reason be required.

The importance of supplying the town of Nasirabad with pure and wholesome water can hardly be overrated: the population is to the garrison as 8½ to 1, and with this all is said.

Bázár requirement. The population is given at 18,000: of these many, for years to come, would continue to resort to the sweet water diggees or tanks.

The requirements would not exceed 4 million cubic feet a year, which quantity would give 4 gallons a day to 14,000 souls.

The storage and filter tank should contain a minimum of one week's supply.

Water analysis. Various analyses have been made, the latest by Surgeon Jervis, 12th Native Infantry. By this the Danta water unfiltered would not appear to be as good as the condition of the catchment area would indicate.

The same water improves after filtration through sand, and after further passing through a Macnamara filter appears as pure a water as can be wished for. Possibly an analysis with perfectly pure chemicals would give reliable results.

The more practical knowledge of the quality of the water is arrived at from the Natives who drink it. The Native is a judge of water, and of several waters available may be fairly trusted to select that which he finds to agree with him best. Judging by this test the Danta water is fairly well spoken of, and it is certainly consumed in large quantities.

The analyses by the Travelling Water Analyst of the drinking water at present supplied to the European and Native troops and the inhabitants of the Sadar Bázár as well as of the water from the Bir and Danta lakes will be read with great interest, as the subject is one of the most vital importance to the sanitary condition of the Military and Civil population.

The Dilwarra well at present supplies the best water of the series. It contains as much as 42 grains of solid matter per gallon, but the large amount of chlorine, 6·37 grains per gallon, is accounted for by the earthy chlorides found in the rocks through which the water percolates. The free ammonia and the albuminoid ammonia are not in excess, and altogether this well may be said to provide wholesome and good water. It would, in my opinion, be a great mistake to prevent the villagers from using it for irrigation, as the more the water is drawn the less concentrated will the salts in it be; but I think in its present condition it is liable to pollution at any time from its proximity to the road by dust and other filth being blown into it, and from the probability of water being drawn from it by a dirty rope and lota used by any wayfarer. In such a manner it is by no means impossible that cholera might be introduced into the camp.

I think the tree growing out of the wall should be forthwith cut down and the roots eradicated, and I recommend that the outside of the tube be covered with a thick casing of concrete as recommended by the Army Sanitary Commission, for a depth of about 18 feet, so as to ensure thorough filtration through the soil. The top should also be covered with a thick dome, and the water raised by a force-pump worked, if necessary, by bullocks so as to irrigate the fields and, if possible, to flow by gravitation to a reservoir nearer camp. I would also recommend, as a further precaution, that part of the field immediately adjoining the well be bought or rented and be allowed to lie fallow, as there may be some danger from its being manured; although this is not, in my opinion, so great as at first sight would appear, for the natural drainage is to the north and east and not to the west of the well, but as it so immediately adjoins the field, I recommend that this precautionary measure be adopted.

The analysis proves that the water in General Phayre's well is not fit to drink. It contains the very large amount of 70 grains of total solid matter and 15·26 grains of chlorine per gallon. Such a water is distinctly saline and cannot be drunk with due regard to health. In my opinion its use as drinking water should be forthwith discontinued.

I have next to remark on the state of the water found in the bhisti's mussocks and in the filter tubs before filtration. It will be observed how greatly the carrying of the water in these mussocks adds to the impurity of the water. I may mention here that at Mhow the ova of nematoid worms were found in the water that had been brought by bhistis to the filter tubs in the barracks. The use of leathern mussocks is a source of preventible disease which, in my opinion, should be at once stopped throughout the army. I recommend that the carts used for the conveyance of the water from Dilwarra well be lined with slate or galvanized zinc, and if it is necessary to employ camels, that galvanized zinc vessels be used instead of leathern mussocks.

I also think that zinc buckets provided with a lid should be used for carrying the water from the carts to the filter tubs, and that these receptacles should consist of galvanized zinc and not of wooden barrels which get in time covered with a slimy fungus. It would add greatly to the comfort and health of the men if these filter tanks were placed above a large earthenware vessel which should hold the filtered water and from which it might be drawn off through a cock. Such arrangement would keep the water cool and is very desirable for health, as it would make the water more palatable. Such large earthenware vessels are in common use in Persia and Turkish Arabia, and are admirably adapted for keeping water cool. Arrangements should also be made to prevent the surface of the floor around the filter tubs being made wet, and in all cases a proper channel should be made to convey water so spilt to a drain outside the barrack. I also recommend the substitution of galvanized zinc tanks instead of water barrels for use in the cook-rooms; and I especially recommend that the conveyance of the water used by the troops be transferred from the Commissariat to the Barrack Department, and that after the day's supply is completed that all vessels used for the conveyance of drinking water be taken to the stores, where they should be systematically cleaned and inspected by a responsible officer. There is no sufficient guarantee now that these mussocks, which have been used in the morning for supplying the drinking water to the troops, may not be used in the afternoon for conveying water from other sources, or that they are not exposed to contamination after use. I also recommend that the sand used in the filters be provided by the Engineer Department and not by the Commissariat. The Executive Engineer has greater opportunities of knowing where good clean sand can be procured than the Commissariat Officer. The danger to the troops in drinking impure water is so great that I strongly urge these measures; for at Mhow I found two of the leaden delivery pipes from the Macnamara filters cracked across, so that water direct from the filter tub was admitted into them instead of passing through the filter. It is satisfactory to notice the efficiency of the Macnamara filter in removing the impurities derived from the mussock.

I now have to speak of the water from the Danta Lake. The catchment area of this lake is most carefully protected from any possible pollution by men or animals, and it has never been occupied by man, so that any organic matter found in it must be of vegetable and not of animal origin.

It contains only 20 grains of solid matter per gallon. This is less than half the amount found in the water of the Dilwarra well and is well within safe limits; for, as Wanklyn says—

"If the solid residue do not exceed 30 or 40 grains per gallon, there is on that account no reason for rejecting the water for domestic use."

The amount of chlorine in the lake water is 7 grains per gallon. This is very high, and if the gathering ground had been fouled by animals, &c., would point to the contamination of the water by excreta; but such a supposition is untenable, and, in my opinion, it is solely due to the saliferous nature of the rocks in this district, and this being so, the present quantity of chlorine may, I consider, be safely disregarded. The amount of free ammonia in the lake is 0·0132 parts per million. The determination of the free ammonia is of the utmost importance

in deciding the character of the organic matter in the presence of such a large amount of chlorine as above given; for, as Wanklyn says—

"When the free ammonia exceeds 0·08 parts per million it almost always proceeds from the fermentation of urea into carbonate of ammonia, and is a sign that the water in question consists of diluted sewage in a very recent condition. In these instances the water will likewise be found to be loaded with chlorides."

But in the Danta Lake water, although the chlorides are in great excess, the amount of free ammonia is very small, and is not more than is found in the pure waters supplied by deep springs, and this confirms me in my opinion that the organic matter is of vegetable and not of animal origin.

The albuminoid ammonia in the lake water amounts to 0·32 parts per million. This is much too high a limit for safe use, and such water without a good system of filtration would be very injurious to health.

The water in the lake is better than the water of the Dilwarra well in so far that it contains less than half the amount of total solids; but there is this great difference, *viz.*, that the well water has undergone natural filtration, so that the albuminoid ammonia in it is reduced to 0·07 parts per million.

It is most interesting to trace the water after it leaves the lake. At the first draw-off in the Native Cavalry Lines it is seen to have lost one grain per gallon of its total solids and ·21 of its chlorine. The free ammonia has disappeared and the albuminoid ammonia is stated to be only 0·19 instead of 0·32 at the lake. This decrease may be explained by the oxygen in the water having in its run of 5 miles oxidized some of the organic matter, but the presence of rotifers shows that it is not a safe water to drink.

The site for the storage tank and filter beds is not, in my opinion, a good one, as they stand not only on ground where formerly the huts of the Native Cavalry savárs were situated, but they are much too close to existing habitations. Major Murray has, however, convinced me that no leakage from the surrounding subsoil can by any possibility take place into the storage tank. He says it is not only water-tight but is also nearly air-tight; but, knowing how readily water will absorb ammonia from the air, I cannot but think that the increase in the albuminoid ammonia found in it is due to the latter cause.

It is most satisfactory to see the results of filtration on this water. The total solids are reduced to 17 and the chlorine to 6·2 grains per gallon. There is no free ammonia and the albuminoid ammonia is reduced from 0·32 in the lake to less than half, *viz.*, 0·13.

The increase in the albuminoid ammonia in the small storage tank is difficult to account for, except by absorption from the surrounding air. It is situated just in front of the hospital and to leeward of privy No. 64, though this is some distance away. I am satisfied that extreme care is taken to preserve the purity of the water, yet no one who has watched the facility with which water absorbs gases will deny that storage tanks should not be near buildings.

The increase of albuminoid ammonia in No. 4 and No. 5 stand-pipes is also probably due to local causes or to matters having got forced up into the head of the stand-pipe from which the sample was drawn. In the former a trace of free ammonia is found and in the latter rotifers have again appeared.

The benefit of filtration is seen in the water after passing through the carbide and Macnamara filters.

This water is said occasionally to smell somewhat disagreeably when first drawn off. This probably results from its having been stagnant in the distribution pipes, which are new. I think after a little time, when the water is more freely drawn upon, this will pass off.

In my opinion, although not at present fit to be taken into immediate use, the Danta Lake water may be made a perfectly safe and wholesome water-supply by the adoption of certain measures. In the first place I recommend that the catchment area be cleared of all vegetable growth. This principally consists of bushes of euphorbia which die and rot and get washed into the lake. Then I think the lake might to a great extent be cleared of the weeds, and I recommend a screen, provided with wire gauze of the finest meshes, being built at some distance away from the outlet, so that the water might be well strained before it

reaches the outlet pipes which also have strainers over them. On the outside of the dam on a site to be selected by Major Murray I think there should be spacious settling and filter tanks. Perhaps these might conveniently be made at the junction of the Bir and Danta pipes.

It must always be remembered that, as Wanklyn says,—

"In filtration speed affects the result to a very great extent. In filtering through beds of sand we may roughly say that the effects of filtration will be almost inversely as the speed at which the filtration is affected. The following are examples of filtration on the organic matter in waters:—

Waters taken from the Thames near Hampton Court where the London Water Companies take their supply.

	Free Ammonia.	Albuminoid Ammonia.
Water taken above the weir and some distance above Hampton Court in July 1867	0·045	0·28
Sample taken above the weir in September 1868 ...	0·02	0·22

"After the filtration effected by some of the London companies this water was delivered in London as follows:—

July 1867	0·01	0·06
September 1868	0·015	0·07

"The filtered water supplied by water companies, no matter whether derived from a lake, from clean mountain streams, or from defiled rivers, yields from 0·05 to 0·10 parts of albuminoid ammonia per million and, indeed, if the filtration be efficient, approximates to 0·05, and when the number rises to 0·10, there is defective filtration. When the filters are overtaxed, as in rainy seasons, water companies supply imperfectly filtered water in which as much as from 0·10 to 0·20 parts of albuminoid ammonia is found in a million parts of the water, and it is a matter of observation that diarrhœa is frequently prevalent in communites which drink such water."

I think, therefore, that endeavours should be made to reduce the albuminoid ammonia to as near 0·05 parts per million as possible, but if it rises to over 0·15 per million, the water should be absolutely condemned for drinking purposes.

If it were possible in this country to use animal charcoal such would be the best filtering medium; for, as Wanklyn says,—

"It not only removes the organic matter, but destroys it by possessing the property of causing it to combine with the oxygen contained in the water and thus converts it into innocuous compounds. Slow filtration through a layer four inches thick of animal charcoal removes all organic matters from water or almost all."

And the use of animal charcoal is cheap, as it has only to be exposed to the air to allow all the organic matters it has retained to be oxidized; but as in this country animal charcoal cannot be used, the magnetic carbide of iron is the next best material. This is prepared by heating hœmatite with saw dust, but is said to give the water a chalybeate taste.

Slow filtration in a filter bed far removed from habitations through fine white sand will, I think, be found the most effective and practical plan to adopt.

The depth of gravel in the filter should not be less than 3 feet, and the layer of fine white sand not less than 2 feet. The coarser particles of gravel should be below and increase in fineness towards the upper surface. Above all, the water should be delivered very slowly, and the pressure should be kept as low as possible, so that there should not be more than 2 feet and better only one foot of water. The sand should at frequent intervals be removed and cleaned.

I wish particularly to invite attention to the very impure character of the samples of water taken from the houses of the prostitutes who associate with British soldiers and also of the sodawater and the ginger-pop sold in the bázár. They are all so bad that I think immediate action is required, and would suggest that either no such beverages be allowed to be sold in the bázár except what is manufactured at the regimental sodawater machine. The bottles used being marked in some way and a strict account kept of the number supplied, and regulations should be made that they be, when empty, immediately returned, or, if this course is considered too stringent, that a tax be placed on the manufacturers of these beverages to cover the cost of their being supplied for the present with Dilwarra water, and they should also be compelled to provide themselves with a Macnamara filter which should be at intervals cleaned under the supervision of a European especially told off for this work.

What is the use of supplying filtered water in the barracks if the men can go into the bázár and drink impure beverages there? If, as suggested in a former part of this report, all the prostitutes were compelled to live in one quarter, one of the carbide filter carts might stand near their houses and be supplied with Dilwarra water, and very frequent inspections should be made to see that this water only was kept in clean vessels for the use of the soldiers who frequent the brothels.

I have had the water of the Anasagar Lake and Doodea well at Ajmere examined, as the former is the principal source of drinking water supplied to the city of Ajmere. It will be seen what a dangerous water it is. I am glad to learn that filter beds are being built which I hope will improve its condition.

The sanitary condition of Ajmere must always be an important point in considering the health of the troops at Nasirabad; but, as it is not under the Bombay Government, I have been precluded from making an inspection of it.

The Doodea well is the one from which the European soldiers at Taragurh are supplied, and the analysis shows that it is quite unfit for drinking. The very high amount of chlorine taken in conjunction with the large amount of free ammonia shows that it is of a most suspicious quality, and, in my opinion, endeavours should be made to find some purer source of drinking water for the troops at Taragurh.

The water used by the inhabitants of the Sadar Bázár at Nasirabad is, without exception, extremely bad and most dangerous, and the introduction of Danta water into it is a matter of the *most urgent* importance.

There can be no doubt that even in its present condition the filtered Danta water would be a much safer water than that drawn from the diggees and wells, and I should certainly recommend that it be made available to as great an extent as possible. And I, moreover, most strongly advise that no time be lost in augmenting the water-supply by connecting the Danta water mains with the Bir tank, for without it the Danta Lake would yield an insufficient supply for the requirements of the Sadar Bázár in addition to the troops.

Rations.

The rations supplied to the European troops appear to be of fair quality, although the meat is sometimes complained of as very lean.

The vegetables supplied are only potatoes, which during the rains are said to be waxy and not of good quality, and onions, with occasionally pumpkins. I noticed a tendency to a congestive state and a spongy condition of the gums among several of the men, and it is highly desirable that green vegetables, such as lettuces, cabbages or, at all events, bháji, should form part of the soldiers' rations.

I think the Stevens' kneading machine should be used in the bakery. The Natives dislike it, as it entails labour, but it is so much cleaner than hand kneading that its use should be insisted upon.

I made particular enquiries about the milk supplied to the families and soldiers, and I find that the stables in which the buffaloes are kept are not under supervision, and that the owners are not particular as to the food or water consumed by these animals. At the hospital the buffaloes are milked in the presence of a patient. In my opinion, milk should only be supplied through the Commissariat Department. It is, however, right to say that, as far as I could learn, no disease has ever been traced to milk.

Disease Statistics.

Statistics regarding disease among the European troops at Nasirabad are unfortunately not available over an extended course of years, as the returns submitted to the Surgeon General have up to this year been kept by regiments and not by stations, and these include detachments serving under very different conditions. I have, however, compiled, from the sanitary reports which were introduced in 1876 at my request whilst acting as Sanitary Commissioner, the returns from each corps from 1876 to 1881 which for the period they embrace are extremely valuable, although, perhaps, it is not sufficiently long to allow an absolutely accurate opinion to be formed regarding the diseases which are prevalent in Nasirabad.

I have, therefore, preferred to take a longer period; and the following table, furnished by the Sanitary Commissioner with the Government of India, shows the admission rate from malarial fevers and the deaths from the chief diseases during the ten years ending 31st December 1881 :—

Aggregate Strength for the 10 years.	Admission Rate per 1,000 of Strength for all Fevers, excluding Enteric Fever, for the 10 years.	Total Deaths from Chief Diseases in the 10 years.				
		Cholera.	Enteric Fever.	Remittent Fever.	Dysentery.	Diarrhœa.
6,213	704·8	15	30	10	10	1

These figures show that Nasirabad is not a very malarious station, as for example Neemuch is, in which the admission rate for malarial fevers in a force of the aggregate strength during the 10 years of 4,306 men amounted to 1,344·4 per 1,000 of strength. In fact, out of 17 stations in the Bombay Command, Nasirabad stands twelfth in the list as regards the lowest admission rate for malarial fevers. The cause of the malaria during the autumn at this station is principally, in my opinion, due to the undrained condition of the sub-soil of the lines and parade ground, and also to the large area of sub-marshy ground on the south-west beyond Cantonment limits.

From the registers which have been kindly lent to me by the chaplains of Nasirabad, I find that the following deaths from cholera have been recorded in the undermentioned years among the European troops at this station. There are no records previous to 1858; but it will be observed that, during the 25 years the registers embrace, this disease has only appeared in 10. It was very bad in 1861, 1865 and in 1867, in which year 70 deaths are recorded, but in 1869 and 1878 respectively there was also a severe outbreak. It will also be noticed the very marked difference in the number of deaths among the men and women belonging to the Artillery and those belonging to the European Infantry; the greater numbers of the Infantry Regiment doubtless partly account for this, but it seems to me that such a large disproportion must depend on some other cause. I would particularly invite attention to the fact that only one woman of the Royal Artillery has died from this disease. Whilst no children of the Royal Artillery before this year had died, and the two children (brother and sister) who died this year were in the Station Hospital with their mother who was a patient there. Both were sleeping in the same bed when one, on the 1st September, was attacked, and died the same day. The other was at once removed home, but was seized next day with cholera, and, after lingering for some days, died of secondary fever. These deaths, therefore, originated in the Infantry and not in the Artillery Lines.

Deaths registered from cholera among European troops :—

Years.	Officers.					Men.				Women.			Children.			Total.
	Cavalry.	Royal Artillery.	European Infantry.	Native Infantry.	Departments.	Cavalry.	Royal Artillery.	European Infantry.	Departments.	Cavalry.	Royal Artillery.	European Infantry.	Cavalry.	Royal Artillery.	European Infantry.	
1858	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	1
1861	2	...	...	...	...	13	...	19	1	1	...	8	...	...	4	48
1862	...	...	...	...	...	...	...	2	...	...	...	1	...	...	...	3
1864	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	1
1865	...	...	...	...	...	2	...	12	...	...	...	6	...	...	6	26
1867	...	...	...	...	...	3	...	51	...	...	...	7	...	...	9	70
1869	...	...	...	1	1	...	...	12	...	...	...	2	...	...	2	18
1875	...	...	...	...	...	...	1	...	...	...	1	...	...	...	...	2
1878	...	...	...	...	...	...	3	9	...	...	...	1	...	...	...	13
1882	...	...	...	...	...	...	...	5	...	...	...	1	...	2	...	8
Total ...	2	...	...	1	1	13	10	110	2	1	1	26	...	2	21	190

The next table shows the months during which these deaths have been registered, and it will be seen that it has never appeared in the following January, February, March, April, November and December :—

Years.	Deaths from Cholera among the European Troops.												Total.
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	
1858	...	...	...	...	1	...	...	...	...	...	...	...	1
1861	...	...	...	...	...	...	4	44	...	...	...	...	48
1862	...	...	...	...	2	1	...	...	...	...	...	...	3
1864	...	...	...	...	...	...	...	...	1	...	...	...	1
1865	...	...	...	...	...	6	...	...	2	18	...	...	26
1867	...	...	...	...	...	2	...	2	66	...	...	...	70
1869	...	...	...	...	...	16	...	2	...	...	...	...	18
1873	...	...	...	...	...	...	...	...	...	2	...	...	2
1878	...	...	...	...	...	...	...	10	3	...	...	...	13
1882	...	...	...	...	...	...	...	5	3	...	...	...	8
	...	...	...	...	3	25	4	63	75	20	...	...	190

It would seem that the disease has some connection with excessive heat, but still more with heat combined with moisture of air, and especially in the soil, as August and September are the two months in the year when its ravages have been greatest. The outbreak in 1865 was ascribed to importation by travellers who arrived from the south of the Cantonment. In that year a lascar attached to the A/E, R. H. A., was attacked but recovered, but no one in the Native troops suffered; and 4 men, 2 of whom recovered and one woman who died, were the only cases in the Sadar Bázár. In the outbreak of 1867, I learn from a report by General Sir Robert Phayre,

"Not a single case of cholera occurred amongst the Native troops' followers in Cantonment or in the large populated bázár."

General Phayre also remarks :—

"From what I have myself observed, and from what I know from those who have been residing at Nasirabad for some time, the southern half of the Cantonment seems to be much more free from epidemics than the northern half."

He also states that the company occupying thatched barrack No. 35 suffered much more than any other in the regiment. This barrack has been since pulled down, but Major Murray informs me that it stood very close to where No. 8 barrack now stands. "Sixteen men (being nearly a third of the deaths from cholera in the regiment) of this company fell victims to the disease. All but one of these sixteen men slept on the west side of the barrack room." General Phayre also states that "I cannot help coupling in my own mind the issue of the potatoe ration with the outbreak of cholera", and says that it was discontinued in the outbreak of 1865. He thinks that potatoes in Rajputána during the months of June, July, August and September are not wholesome, and remarks that this esculent should not form part of the soldiers' rations during those months. The disease had been prevalent in the district and in the city of Ajmere, and all communication with that place had been prevented, but yet the disease broke out. General Phayre says :—

"The theory of the cholera wave in the atmosphere would not appear to be borne out in this instance, for the disease broke out in the European Regiment and accompanied them. No single case of cholera occurred in the Cantonment after the European troops left."

As will be seen further on, the only deaths from cholera reported in the Sadar Bázár from 1876 to 1881 occurred in 1878, when 8 persons died from it. I also find that 4 deaths took place in that year among the native cooks attached to the European Infantry Regiment. In referring to the outbreak in 1882 I cannot give a better description than that contained in the following extract from the report of the Officer Commanding the Station to the Assistant Quarter Master General, Mhow, dated 13th October 1882 :—

"2. The first appearance of cholera in the vicinity of Nasirabad was reported on Monday, the 21st August, at Rajgarh, 10 miles west, and Rajorsee, 4 miles to the west of Cantonments. The troops were prohibited from going near any villages between the Deesa and Ajmere roads, and various precautions were taken to prevent the importation of the disease.

"3. On the 22nd two men of the 1st Worcestershire Regiment were attacked: one in barrack No. 24, the other in barrack No. 28. Neither of these men had been near the infected villages. Both cases were fatal. The rooms in which they were seized, were vacated, purified, and whitewashed.

"4. On the 25th idem the third case, also fatal, occurred in a woman seized in No. 4 block, 1st Worcestershire Regiment married quaters. The patcherry was vacated, purified, and whitewashed.

"5. At this date surrounding villages were reported quite free of the disease.

"6. On the 30th idem a man of the 1st Worcestershire Regiment was fatally attacked in the Station Hospital. The ward was at once vacated, purified, and whitewashed.

"7. On the 1st September a child belonging to M. 1, R. A., was attacked in the female hospital and died. The patients in this hospital were moved into one of the rooms of building No. 28, which had been vacated on the 23rd ultimo, and purified under para. 20, Rules for Outbreak of Cholera.

"8. On the 2nd a child was attacked in patcherry No. 6. The building was vacated, purified, and whitewashed. This case lingered on till the 23rd idem, when the child sank.

"9. A man of the 1st Worcestershire Regiment was seized in the Station Hospital on the night of the 3rd September and died on the morning of the 4th. Another man was attacked the same morning while the patients were being removed into the vacant rooms of barrack No. 28 and died that afternoon. The hospital buildings were vacated, purified, and whitewashed.

"10. A child was seized in family quarters No. 6, 1st Worcestershire Regiment, on the same day. The patcherry was vacated, purified, and whitewashed.

"11. On the 6th a hospital apprentice was attacked in a small office room in the middle of barrack No. 28 (at the time used as the Station Hospital). The building was vacated and the male patients moved into a camp pitched beyond and to leeward of the Cavalry Hospital. The women were moved into No. 5 barrack: No. 28 was purified and whitewashed.

"12. The disease may be said to have altered in severity from the case reported in para. No. 10.

"13. On the evening of Wednesday, the 6th September, a child (belonging to 1st Lancers) was fatally seized in a hut towards the centre of the Cavalry Lines. This hut, with one on either side, was at once vacated, and on the following day the squadron, with families, were moved into camp on the Artillery Hill about a mile to the south of Cantonments. The huts were all vacated (the infected one purified) and were whitewashed by the Public Works Department at a cost of Rs. 120. The squadron remained under canvas until the 17th idem, when no further case having occurred, the whole returned to the lines.

"14. On Thursday, the 7th September, a child was attacked in No. 5 married quarters, 1st Worcestershire Regiment. The block of buildings was vacated, purified, and whitewashed.

"15. About midnight of the 9th a man of the 1st Worcestershire Regiment was seized in the preparatory camp (containing the patients moved from barrack No. 28; *vide* para. 11). The patients were moved to a camp which had been prepared at No. 8 Site, Dilwarree.

"16. The cases detailed in paras. 10, 11, 14 and 15 have recovered; the others were fatal.

"17. The rainfall had been as recorded marginally.

June	·81
July...	15·91
August	4·92
September	3·13

"18. The maximum temperature is also recorded—

June	106°
July	96°
August	90°
September	92°

"19. Another camp was prepared at site No. 15, Motipoora, but not being required, the tents were moved to Artillery Hill and left standing until the 9th, in case of their being wanted for a camp."

I learn from Dr. Chapman that the wife of the Sergeant-Major of the Battery Royal Artillery died from diarrhœa on the 29th June and that diarrhœa had

been prevalent in the regiment since the beginning of August. As regards the first cases which were brought from barracks Nos. 24 and 28 to hospital simultaneously on the 22nd August, I also learn from Dr. Chapman that both the men were placed in the ward on the ground floor of hospital building No. 29. On enquiry it appeared that one man had been out on a shooting expedition with 4 comrades two days previously, but had not gone near an infected village. He as well as the other men had drunk water from a well near a village, but they boiled the water before drinking it, and none of his comrades on the shooting expedition suffered. He had not been in the bázár for some days previously. The second man was undergoing punishment for drunkenness at the time of seizure. As will be seen, the most numerous cases took place in the hospital buildings and in the patcheries.

I would venture to remark that, in my opinion, it was not judicious to have moved the first cases into the Station Hospital or the patients from the Station Hospital into a building in which one of the first cases occurred. It will be noticed that a hospital apprentice was attacked in this building after it had been occupied by the patients. The Officer Commanding and Dr. Chapman have pointed out the great necessity for having a contagious ward built; but I would suggest that no pucca building be used for the treatment of cholera cases. I think there should be in all stations a distinct and isolated building set apart to leeward of the hospital and barracks for the treatment of any severe cases of diarrhœa which may occur during the season cholera is known to be likely to break out; but I would not treat cases of decided cholera in it. In my opinion, a good shed with a floor that can be dug up, and which could be made to afford sufficient protection against the sun, should always be ready for the reception of such cases. In it there should be the freest possible ventilation, and to it should be brought all suspicious and decided cases. They should never be admitted into the wards of a General Hospital. I must also record that, with the exception of the child of the 1st Lancers, no one belonging to the Native troops or the followers in camp or in the bázár was, during 1882, attacked with cholera. The disease broke out among, and was solely confined to, the persons occupying the Infantry barracks.

But Nasirabad is essentially a station where enteric fever has prevailed to a very great extent, and, in fact, it is next to Karáchi the station of the Bombay Command in which the greatest mortality from this disease has occurred. The British troops consist of a battery of Artillery and the head-quarters of a European Infantry Regiment. The average strength of each is unfortunately not given in the returns from the Sanitary Commissioner with the Government of India; but on an average of 6 years (1876 to 1881) the battery has had a strength of 141 and the Infantry of 481 men. I think these figures may be accepted as showing the relative average strength of each corps.

During the 10 years ending 31st December 1881, 43 admissions and 30 deaths from enteric fever took place. The statistics for the 10 years are not available as regards the admissions in each month of the year, but the 30 deaths occurred in the following months :—

April.	May.	July.	August.	September.	October.	November.	December.	Total.
2	1	1	4	7	4	7	4	30

From this it will be seen that 26 out of the 30 deaths took place in the latter half of the year. These deaths were recorded to have occurred at the following ages :—

Years.	18	19	20	21	22	23	24	25	26	27	30	32	Total.
	1	2	4	6	2	3	2	1	4	3	1	1	30

so that 20 out of the 30 were young men under 25 years of age. Unfortunately the length of Indian service of the 7 men who died in 1872 from enteric fever is not recorded, but the remaining 23 had served for the following periods in India:—

Months.			2 years and under 3.	3 years and under 4.	4 years and under 5.	9 years and under 10.	Total.
2	4	7					
1	1	4	3	7	6	1	23

During the 10 years, of the 43 admissions 3 only (of which 2 terminated fatally) took place in the Royal Artillery, so that it is evident the disease principally attacks the Infantry. The percentage of admissions to average strength being in the Infantry 8·32, whilst that for the Artillery is only 2·13.

I think it is not unlikely that enteric fever is endemic among the inhabitants of the Sadar Bázár, and I am borne out in this opinion by the following very interesting letter from Dr. Clark, the zealous and most able Medical Missionary at this station who has had unrivalled opportunities, during the 10 years he has been working here, of seeing disease among the numerous patients who attend the Mission Hospital; but it must be remembered that if the filthy state of the bázár were the sole cause, it would operate equally against the Artillery as against the Infantry. Dr. Clark says:—

"In reply to your request for a short account of the fevers which I have seen in my practice here during the last 10 years, I have to remark that it seems to me that it would serve no good purpose for me to take up your time with a detailed description of the remittent and intermittent fevers common in this part of the world. Suffice it to remark here that many cases of the remittent type present a typhus or asthenic character with very marked nervous depression and diminished activity of the special senses. This, according to my experience, is a very fatal type of fever, and is commonly accompanied by hepatic disturbance.

"In answer to your question as to whether I have any grounds for supposing that enteric fever is endemic among the inhabitants of the Sadar Bázár at this station, I have to reply in the affirmative.

"A few of the cases treated in the Mission Hospital here are undoubtedly cases of continued fever, and my reasons for supposing them cases of enteric fever are the following, *viz*:—

I.—Duration of the cases.
II.—Evening exacerbation.
III.—Foetid diarrhœa.
IV.—Hemorrhage from the bowels.
V.—Gurgling in and tenderness over right iliac fossa.
VI.—Active delirium.

I have not observed the characteristic rash of typhoid or enteric fever in any of the cases; nor have I in any case been able to make a *post mortem* on account of the prejudices of the people.

"In answer to your question as to the causation of the disease, I have simply to refer you to the gathering ground of the diggee from which so much of the water used for domestic purposes is obtained. It is situated in the immediate neighbourhood of the town; a large proportion of the town cattle are collected upon it every morning before proceeding to pasture; the manure is collected in heaps upon it, dried in the sun, and stacked upon it; and I have reason to believe that refuse is brought from the bázár and mixed with the ophila made from the cattle droppings gathered upon the spot.

"I have further to remark that in the ordinary course of my daily duty I have generally twice a day to walk over the diggee gathering ground, and that there is scarcely a morning that the senses of sight and smell are not offended by human excreta, both liquid and solid, deposited during the night.

"To those who believe in the pythogenic origin of typhoid or enteric fever the above facts are significant.

"Another matter calling for notice in this connection is the fact that the refuse from the Cavalry stables is carried daily past my bungalow to the bázár, where it is used by the cow-feeders. The refuse from the Artillery stables, I believe, is put to a similar use. So great is the competition for this stable refuse, that the Commanding Officer of the Battery at present stationed here, while still on the march and still some considerable distance from the station, was met on the road by parties anxious beforehand to secure the contract for it. It is doubtless true that some of this refuse is used by the parchers of grain in their trade as fuel, but there is good reason to believe that most of it is used for feeding milch cows.

"The Native practitioners with whom I am acquainted speak of two kinds of endemic continued fever, and name them from the characteristic eruptions Motijeera and Panjeera. These they speak of as lasting for about 20 and 30 days respectively. They regard them as both very fatal and infectious. Prompted by superstitious feelings they shut up the persons attacked by these diseases in close room and prevent all access to them. I have never had an opportunity of accurately observing any of these cases, but have been frequently called upon to treat the patients after they were convalescent. I have at present a case in the female ward in which amputation below the knee was rendered necessary by dry gangrene (one of the sequelæ in this case of Motijeera). They are certainly very exhausting diseases, leaving their victims weak and emaciated beyond measure. Recovery is slow and protracted, and the constitution is often permanently impaired.

"Are these diseases not the typhus and enteric fevers of scientific medicine modified by local surrounding and injudicious treatment?"

The question I have asked myself regarding the European troops is, are there any conditions affecting the Infantry which do not affect the men of the Battery? The Artillery men who died were respectively of the ages of 26 and 30 years. As is well known, the men in the Royal Artillery are, as a rule, older and of more powerful physique than the Infantry, but they have drafts of young soldiers sent out to them who would correspond in age to the men of the Infantry. The men in each arm have their drinking water brought from the same sources; they eat the same food; they are clothed in the same way. Their amusements are the same. They are equally exposed to the dangers of the bázár. The duties in the Artillery are much heavier than in the Infantry. The gunners are perhaps not quite so much exposed on night guards as the Infantry; but at Nasirabad the night guards among the Infantry are exceptionally light, as they only consist of regimental guards with occasionally a guard on the garrison cells. Their lines adjoin each other, and there is the same absence of any sub-soil drainage in each. What condition, then, can affect the Infantry which does not affect the Artillery? I think the fact that their barracks are more crowded together is a most important factor. For example, No. 7 barrack is separated from No. 8 by only 19 feet, and when you are standing in one barrack you look right down the other. No. 11 is 81½ feet from No. 12, No. 16 the same distance from No. 17, and No. 21 also from No. 22. No. 23 is only 50 feet from No. 24. These are the only distances I measured, but there may be other barracks equally close to each other.

Then, again,

No. 12	in the front row	is	151	feet from	No. 16	in the	2nd	row.
„ 16	„ 2nd	„	171	„	20	„	3rd	„
„ 20	„ 3rd	„	146	„	21	„	4th	„
„ 20	„ 4th	„	147	„	24	„	5th	„

This amount of space is not sufficient to permit a thorough perflation of air in and around the barracks in a climate like Nasirabad during the hot weather and rains, and taking into consideration the large number of subsidiary buildings. In my opinion freeer ventilation is desirable round these barrcks, and this might be afforded by pulling down some of the quarter company barracks. I think Nos. 21 and 22 are objectionably placed, as they keep out the breeze from Nos. 23 and 24, and any infectious disease in them is likely to spread to the barracks in their immediate rear. Fourteen of the 16 quarter company barracks are now occupied and afford accommodation for 168 men; but if the use of the 2 barracks, which have been converted into a Station Hospital, was resumed, accommodation for 126 men would be provided, and the remainder might be accommodated in barrack No. 28. Of course, if this were done, a new Station Hospital would have to be built, as I think is in any case very desirable, for the present buildings are not well adapted for a hospital or as is desirable for the sick; and the arrangement would also permit of the old Cavalry Hospital being utilized for other purposes

than as a residence for Natives, and thus the sanitary condition of patcherries Nos. 5 and 6 would be much improved.

I also consider than an even still more important factor than the close proximity of the barracks to each other is to be found in the fact that whereas the Artillery barracks are built on a site which has always been occupied by Europeans, the Infantry barracks are built over a site polluted during a long period of years by a Native Infantry Regiment. A reference to the map shows that barracks Nos. 8, 9, 10, 12 and 5 in the front row and Nos. 13, 14, 15, 16 and 17 in the second row stand or partly stand on ground which the Native Infantry pendalls and the Artillery horses formerly occupied. It is much to be regretted that there is no register to show over an extended course of years the number of each barrack from which cases of cholera and enteric fever have been admitted. Surgeon-Major Chapman has commenced such a register from this year. Such should, I think, be always kept in every station, and in course of years it would prove a most valuable record. Major Murray informs me that during the cholera epidemic of 1867 the floor of No. 12 barrack was dug up on account of the number of cholera cases that had occurred in it.

I cannot but believe that after heavy rain, when the sub-soil has become thoroughly soaked at the time of year when the temperature is still high, emanations from decomposing organic matter, probably of animal as well as vegetable origin, even after this long period arise which act prejudicially on the health of the men. I consider, therefore, that the practice of allowing the waste water from the bath-rooms and wash-houses, &c., to flow over gardens and to trees in the vicinity of the barracks is a very dangerous proceeding, taking into consideration the previous history of the soil and sub-soil, and in my opinion it should be forthwith stopped. I recommend that instead of the waste water being removed in iron receptacles and carted away that it should convey itself through earthenware pipes to a garden on a site to be hereafter selected; and I also strongly recommend that these pipe drains be utilized for the conveyance of the excreta from the privies and urinals. These places might be, as now, in separate buildings; but I maintain that the removal of these matters by the agency of water must not only be infinitely more effective than by hand, but much less expensive in the long run, whilst the danger to health from properly constructed water closets in comparison with the present system would be incalculably less. This station, being provided with Danta water, renders such a course possible.

If, however, the present expensive system by hand removal *must* be maintained, I think the arrangements in force are capable of great improvement. To carry out the dry-earth system properly, the delivery of the earth over the excreta should be automatic instead of trusting to each man to throw a scoop-full of earth into the receiving vessel. A very simple arrangement could be made by which, when a man rose from the seat, a given quantity of earth should fall into the receptacle below from a hopper above.

I also think sub-soil drainage is absolutely necessary: no moisture in a soil can be present together with organic matter without giving off deleterious gases, and the more aerated and consequently the drier the soil is during and after heavy rains, the less likelihood of disease germs being evolved. Although I would much prefer to see Nasirabad given up as a station for European troops, or, at all events, barracks for the Infantry Regiment built on an entirely new site, as indeed may eventually prove to be absolutely necessary, yet such a course would entail so heavy an outlay that I fear for the present there is no hope of its being adopted; and Major Murray has suggested to me that if it were possible for a few successive cold weathers to remove the Infantry from these barracks, the best way of remedying the great mistake of having built them over a previously occupied site would be to deeply plough up the soil around them and thus to expose it to the sun and air and to take a rabi crop off the ground. I concur with him in thinking that this would probably be the best means to adopt as regards rendering the soil again sweet and pure. No damage would be done to any of the buildings, and after some time the surface might be well rolled and sown with hurriali grass. This suggestion may seem to some extravagant; but I would ask those who object to it to remember the broad fact that there is something about these Infantry barracks which exerts a most prejudical influence on the health of

the men; that this something is annually excited into activity and attacks those predisposed to enteric fever, principally during and after the rains. Where does this poison lie? Why does it manifest such marked activity after the sub-soil has become wet? If it depended on the general causes of malaria which at that season renders old and new residents in India equally liable to attacks of fever, why do the men of the Royal Artillery enjoy such a comparative immunity from this disease, although they suffer as much from malarial fevers as the Infantry? For these reasons, without denying that the disease may in some cases depend on other causes, I cannot help thinking that local conditions exert a very potential influence in the origin of enteric fever in the Infantry barracks at Nasirabad. It certainly does not depend on neglect as regards surface cleanliness, and the greatest attention is paid by the Officer Commanding to the conservation of the drinking water. A man is specially told off to examine the filter tubs, each of which has the lid locked after being filled by the bhistis. The men in the regiment are exceptionally well behaved. There is very little drunkenness or crime among them; they are young soldiers, but, as times go, a fine body of young men, and yet they suffer.

During 1882 there have been the following cases of enteric fever among them, which occurred in the undermentioned months :—

Months.	January.	June.	September.	October.	Total.
Admissions	1	1	2	8	12
Deaths	1	1	1	5	8

So that in this as in previous years the chief incidence of the disease has taken place during the rains.

These men were of the following ages :—

Years of Age.	21	22	23	24	25	26	27	32	37	Total.
Admissions ...	1	2	1	3	1	1	1	1	1	12
Deaths	1	1	1	1	1	1	...	1	1	8

The strength of the regiment at the head-quarters on the 1st July 1882, according to age, was as follows :—

16 years and under 17.	18 and under 19	19 and under 20.	20 and under 21.	21 and under 22.	22 and under 23.	23 and under 24.	24 and under 25.	25 and under 26.	26 and under 27.	27 and under 28.	28 and under 29.	29 and under 30.	30 and over	Total.
1	2	10	21	28	27	105	94	50	36	28	23	21	85	531

So that there were 288 men under 25, of whom 7 were attacked, and 243 above 25, of whom 5 were attacked.

The length of service of those attacked was as follows :—

Years.	Under 2 years.	2	3	4	5	10	12	Total.
Number	2	3	1	1	3	1	1	12

And the time they had passed in the station. :—

Months.	1	6	8	9	10	11
Number	1	1	2	2	5	1

These men were admitted from the following barracks :—

Barracks, Nos.	5	8	9	12	20	21	22	23	Total.
Admissions	2	1	2	1	3	1	1	1	12

This table might be thought to contravene my argument of a polluted soil, as half the cases came from barracks which do not actually stand on the old site; but it must be remembered that the men in these barracks must have breathed air which had just passed over it, and it would be difficult to say in Nasirabad where buildings have not formerly stood.

I think it would be a wise precaution to order, as in cholera outbreaks, each barrack in which a case of enteric fever had occurred to be fumigated with sulphur.

I have made particular enquiries regarding the supply of milk; but I am informed that the men rarely make use of milk, and the women and children have not suffered to any great extent.

The next point I have to consider is, looking at the station as a whole, its barracks, hospital, the state of its surface and sub-soil drainage during and after the rains, its water-supply, its bázár and particularly the time it has existed, whether it is a station to which I should feel disposed to send troops predisposed to enteric fever, and I am forced to the opinion that taking all these points into consideration it most certainly is not. It must ever be remembered that enteric fever is essentially the disease of the young soldier who has recently arrived in the country; and as this disease most certainly becomes rife during the months of August, September and October, I most strongly recommend that no European Regiment be sent to Nasirabad until it has completed at least 5 years' service in India, and that all young soldiers under the age of 25 and with less than 3 years' service in India be sent out of the station during the enteric fever months. This may be difficult for the Military Authorities to arrange; but if the men are to be preserved from this disease, it is, in my opinion, the only course to adopt.

I had much wished to obtain the statistical returns of the men sent annually between April to November to Taragurh, but I regret to say they are not available. I have, however, found the admission and discharge book for the years 1866-67 and '68. No case of enteric fever occurred among the troops at Taragurh during those years. The hospital record book is the only record for the years 1872-73-74 and '75. No enteric fever apparently occurred in 1872-73 or '74; but in 1875 there is a note made by the medical officer on the 23rd August, stating that a man of the Royal Artillery was admitted for typhoid fever, and a few days afterwards it is said he was progressing favourably. The admission and discharge book from 1880 to date is complete, and the only case of enteric fever was a man of the Leicestershire Regiment who had been transferred from Nasirabad on the 4th October and who died on the 22nd October. I have been unable to find any further particulars of this man, or how long he had been ill in Nasirabad. I also find in a case book of the Leicestershire Regiment, which I procured from Jubulpore at the suggestion of Surgeon-Major Chapman who was in medical charge of the regiment at this station, that a man was sent down from Taragurh on the 9th November, 1881, suffering from enteric fever. He had been admitted into hospital on 29th of October, and died on the 17th November. It would appear that the men suffer much less at Taragurh than at Nasirabad; and it would in my opinion, from a sanitary point of view, be desirable to remove the European troops from Nasirabad to Taragurh or other hills above Ajmere if a sufficient supply of good water can be found for their requirements; but until such change, if approved of by the authorities, can take place, I recommend that annually all recent arrivals, if under 25 years of age, be sent to pass the rains at Mount Abu, to which, now that there is a railway, is no longer a matter of difficulty.

Women and Children.

No deaths were reported among the women belonging to European corps at Nasirabad from enteric fever during the years 1872 to 1881, but a woman of the Worcestershire Regiment, who formerly lived in patcherry No. 5 and afterwards in No. 4 block, died in September 1882 from this disease.

Three deaths from enteric fever were reported to have occurred among the children during the 10 years: one in 1872, another in 1875, and the third in 1876.

Since the 1st January 1882 to date (November 14th) the following admissions from all causes and deaths have taken place among the European women and children at this station:—

Women.

	Royal Artillery.—Strength 13.		1st Worcestershire Regiment.—Strength 33.	
		Percentage to strength.		Percentage to strength.
Admissions	16	123·07	45	136·40
Deaths	1	7·70	2	6·06

Children.

	Royal Artillery.—Strength 19.		1st Worcestershire Regiment.—Strength 38.	
		Percentage to strength.		Percentage to strength.
Admissions	16	84·21	62	163·15
Deaths	3	15·79	18	47·56

The last table is most instructive. The higher admission and death-rate among the children of the Infantry tells its own tale. It is sad to think that nearly half the children in the Infantry have died since the commencement of the year, and makes one lament that they were not sent up to Mount Abu, especially as the married quarters there were standing vacant during the rains.

NATIVE TROOPS.

The Cavalry Lines.

Lines for 2 squadrons of Native Cavalry, at present the 1st Bombay Lancers, 141 strong, are situated on the right of camp, but are retired somewhat to the east from the general alignment of its front. The remaining thatched barracks, formerly occupied by the 8th Hussars, being in front and to the west of them.

There are four lines, each containing 2 blocks of tiled pendalls facing north and south. Each block has 8 rooms on either side of a longitudinal wall extending from east to west under the ridge, which is 13 feet from the ground. The height of the plinth is about 1 foot. Each room has a superficial area of 84·4 square feet both in the married and single men's huts. The ventilation is effected through the door 4½ feet high and through the tiles. In front of each hut is the objectionable arrangement usual in Native Cavalry Lines of having an enclosure in which sometimes hay is kept and in the corner of which is a bathing place and in another a latrine without any receptacle. I think that this enclosure should not be permitted in front of the single men's huts. The married men must have them, as their wives are high caste and *purddnishin*. I think also the use of iron receptacles in the latrine should be insisted on. There are quarters for the Risáldárs on the west of the 2 lines for each troop and for the Jamádárs and Náik Risáldárs on either flank. The horse lines are on the east. The only drainage for these lines is surface, but it is said to be sufficient. The quarters for the native followers, syces, grain-sellers, &c., are on the north of the lines, and there are tatties 280 yards on the north-east for their use, the filth being buried in the ground, which is afterwards cultivated. The standard guard is on the west, and is a suitable building in all respects. The hospital is some distance off on the north-west of the lines on the highest ground in camp, the high ground in its immediate vicinity being 1,470 feet above mean sea level. It is a stone building standing on a high plinth of about 2 feet, and has a broad verandah on each side of the main ward which is 43′ × 22′ × 16′ and which has 3 doors on either side with clerestory windows over them and a door on the north and south. In the centre are on one side of the passage the dispensary and on the other a store-room and beyond on the north 3 wards 14 feet square by 16 feet high intended for isolation wards. The latrine for the patients is a prolongation from the east end of the verandah on the south, the west end being also prolonged to form 2 bath-rooms. The patients in hospital are provided with water drawn from a well between it and the lines in which the water is said to be very good. The depth to the water is now (November 7th) about 30 feet from the surface. The well is not covered, but the sides are cemented inside, not outside the tube as it ought be for about 15 feet down to solid rock, and there is pavement round the well on which the bhistis' bullocks stand. The Risáldár informs me that most of the men use the Danta water, which is brought to the head of the lines. The horses also are watered from a trough on the west of the lines which is supplied by it. This water is not filtered, as the pipe is taken off the main before it reaches the storage tank in which the filter is situated.

Native Infantry Lines.

A Native Infantry Regiment, at present the 12th N. I., is quartered in lines which are on the left of the camp. There are 16 lines, and in each line 2 blocks of pendalls; that on the west is reserved for married men and their families, and that on the east for the single men, so that there are 32 pendalls in all. Each pendall contains eleven rooms facing north and a similar number facing south, as they are placed back to back. The pendalls are built with sun-dried bricks. The plinths are very low, being only about 10 inches in height, and the height to the ridge of the tiled roof is 13½ feet. A wall extends along the length of the building under the ridge from which the roof slopes down on either side to a small verandah, which in front of the unmarried men's huts is left entirely open, but in the married quarters is only partially built up, as Colonel Reid, the Commandant of the 12th N. I., has most wisely insisted on a clear air space of 2 feet being left along the top of the wall enclosing the verandah. The married and single quarters are said to be of similar dimensions. The superficial area of each hut is 75·5 square feet, that of the verandahs being 49·5 square feet, whilst the cubic capacity of each hut is 831 cubic feet. The height to the ridge is 13½ feet. Height of external wall 8′6″ and of the doorway of each hut 4′7″. A small circular ventilating opening, provided with a cover for the monsoon, has been left over each hut for the escape of foul air, but there is a constant and upward movement of air through the tiles. Indeed, during the monsoon the rain comes in much more freely than is desirable. The lines are under process of reconstruction. The 2nd Grenadiers, which left the station in November 1881, had, before their departure, rebuilt 6 pendalls and 2 Native officers' houses; but the 12th N. I., during

the 9 months they have been here, have rebuilt 19 pendalls and 5 Native officers' houses, leaving 7 pendalls and 9 Native officers' houses still to be reconstructed. In the verandah of each of the married quarters is a náni or mori,—a paved place where the women and children bathe,—and this ablution water flows out through a channel made of half tiles, and is intended to be led to the trees planted in front of the huts; but the soil round the trees has not been lately dug up. The surface, therefore, round them being hard, does not readily absorb water, and it flows on to the road between the 2 blocks where it is gradually absorbed or evaporated. This practice renders the ground in the vicinity of the huts as well as the huts themselves damp and unwholesome. The young children also use latrine pits in front of the huts; this consists of a chattee sunk into the earth and covered over with a tile or stone until cleaned by the sweeper. The men of the regiment for natural purposes use trench latrines which are situated in a field 230 yards on the south of the lines. The tatties are periodically moved and the field is in course of time thoroughly manured. It is then ploughed up cross-wise and crops are taken off it. The women use 2 latrines on the standard plan which have been built 130 yards to the south of the lines. Six urinals, 3 on the west and 3 on the east of the lines, have been provided for the regiment. These consist of a space enclosed by an external masonry wall, inside which are 2 open places surrounded by cut stone in which dry sand is placed as well as a row of chattee pots. These urinals answer admirably, and no offensive smell was detected either in their vicinity or inside them, though it would have been better to have had no lime or masonry round them. The filth from the women's latrine and the urinals is carted away to the Sadar Bázár manure yard.

The Native officers' quarters, 16 in number, are on the west of and at the head of each line. They are enclosed. Some of those that have not been reconstructed, are in a most dilapidated condition and appear to be on the point of falling, but the 12th N. I. has been ordered away before being able to complete the good work already done. The sepoys for the most part draw their drinking water from the 3 hydrants connected with the Danta water-supply which are placed at intervals along the east of the lines. One of them is reserved for high-caste Hindus and Musalmáns, one for Maráthás, and one for men of low caste; but some prefer to use the water from the well in the hospital compound, which, as will be seen from the analysis, is unfit for drinking. Each of the 3 hydrants above named, contained at the time of my visit filtered water, but sometimes unfiltered water is supplied to two of them. The drainage from the lines is entirely surface. The water is said to lie for some time after rains, as this is the lowest end of camp. The hospital is a new building standing on rising ground, which has been ascertained by the Topographical Survey to be 1,407 feet above mean sea level. It is on the south-east of the lines. It consists of 2 blocks united by a central building and is built of stone; the roof consists of slabs. It stands on a well-raised plinth of 4½ feet at the east end and 3½ feet on the west. The hospital is flagged throughout with slabs set in mortar over 6 inches of concrete. In each block there is a ward, 115' long by 22' broad, in which 30 patients can be accommodated. The cubic space per patient being 1,348 cubic feet. A 12 feet verandah extends all round the building, the outer side of which is furnished with moveable jhamps. Patients are kept in the verandahs when the wards are full. The dispensary and office are in the centre of the hospital, and there are also wards where the staff patients are treated. The arrangement regarding the latrine is, in my opinion, not a good one, as at each end of the building east and west the verandah is prolonged on the north and south sides, leaving an open place between the 2 projections; that on the north is converted into a latrine and that on the south is used for a bath-room, sweeper's quarters, &c. There is a persistent odour from the latrines which is very perceptible. I think the latrine should be separate from the main building.

I have attached to this report tables of the chief diseases among the Native troops at this station in each year from 1876 to 1881.

It will be observed that a case of enteric fever is recorded to have taken place in the 16th Native Infantry during the month of October 1876 and that 3 cases in the same regiment occurred in 1878—2 in the month of May, and 1 in July. These cases recovered, so that there was no opportunity of verifying the diagnosis by a *post-mortem* examination.

The chief disease from which the Native troops suffer in Nasirabad is malarial fever, principally ague.

The following table shows that this occasionally is very prevalent, and the returns indicate it occurs principally in the autumn and beginning of the cold weather:—

Years.	1876.		1877.		1878.		1879.		1880.	1881.
Corps	Squadron, 3rd Light Cavalry.	16th N. I.	3rd Cavalry.	16th N. I.	3rd Light Cavalry.	16th N. I.	Squadron, 1st Bombay Lancers.	2nd Grenadiers.	2nd Grenadiers.	2nd Grenadiers.
Strength	106	664	114	652	128	679	120	604	629	603
Admissions from malarial fevers.	62	732	46	339	164	1,415	173	1,181	465	419
Percentage to strength.	58·50	110·24	40·35	51·99	128·13	208·39	144·10	195·53	73·93	67·99
Rainfall	17·83		13·5		24·17		28·67		15·55	20·62

It will be also noticed that malarial fevers are more rife among the Infantry than among the Cavalry. This might be expected, as their lines are at the lowest end of camp, and it strongly points to the necessity for sub-soil drainage. In the end of 1879 the 2nd Grenadiers moved out of Nasirabad on account of the large amount of fever from which they were suffering, the result being that they soon shook it off and returned to camp quite well. I am sure that this course, *viz.*, to leave the site exposed to malarial influences, is the best that can be adopted when a regiment, whether European or Native, is attacked with fever, and I wish it were more generally followed throughout the Army.

Sadar Ba'za'r.

At the entrance of the Sadar Bázár on the north of the main street is the Mission Hospital which is under the able supervision of Dr. Clark, the Medical Missionary attached to the Mission which has been established at Nasirabad. This institution virtually takes the place of a small Civil Hospital, as both male and female in-patients are admitted into it. There are 2 wards. In the male ward twelve and in the female six patients can be accommodated. It is largely attended, not only by the inhabitants of the Sadar Bázár, but also by the residents in the surrounding villages. The statistics are not kept according to the returns in use in Government institutions; but I learn that, during the year ending the 31st October 1882, 43 female and 198 male in-patients were admitted, besides 7,596 out-patients who were treated at the dispensary. I am unable to show the total working of this institution, as the number of out-patients remaining on the 1st November 1881 is not known. Of the above 7,596 persons, 1,167 belonged to the surrounding villages. It follows, therefore, that 6,430 inhabitants of the Sadar Bázár received relief at this most valuable institution during the 12 months; and that these poor people fully appreciate the services rendered them, is shown by the fact that during the 12 months the total number of attendants at the dispensary amounted to 37,630. During the same period there were 19 major and 672 minor operations performed, which is highly creditable. The total cost of the institution, excluding Dr. Clark's salary, is about Rs. 2,000 per annum. Of this amount the Cantonment Committee contribute Rs. 30 per mensem, which, looking to the incalculable amount of good the hospital bestows on the inhabitants of the Sadar Bázár and also to the fact that the services of a medical officer of the highest skill are given gratuitously, appears to me to be a very small sum, and I should strongly advise that the grant paid by the Cantonment Committee be raised to the extent of Rs. 50 per mensem, which would allow Dr. Clark to provide many little things which are very desirable in the interests of the sick. I should state that the building in which the hospital is situated, belongs to the Cantonment Committee, and that Dr. Clark attended eleven hundred patients in their own villages during his last cold weather tour.

The Sadar Bázár is situated on the south-east of camp at a distance of about a mile from the European barracks and immediately in rear of the

compounds occupied by officers on the staff. It is estimated to cover an area of about 226¼ acres, and according to the census of 1881 the total population amounted to 18,331 persons, including 20 Europeans, of whom 9,450 were males and 8,881 were females, being in the proportion of 93·9 females to every 100 males. It consisted of—

	Population, 1881.			Percentage on entire Population.		
	Males.	Females.	Total.	Males.	Females.	Total.
Hindus	3,168	2,948	6,116	33·52	33·20	33·36
Mahomedans ...	2,268	2,203	4,471	23·83	24·80	24·39
Buddhists or Jains ...	142	107	249	1·50	1·20	1·36
Christians... ...	86	31	117	0·91	0·35	0·64
Parsees	31	24	55	0·35	0·27	0·30
Others	3,755	3,568	7,323	39·72	40·18	39·95
Total ...	9,450	8,881	18,331	51·55	48·45	100·

6,257 persons resided in 1,668 houses of the better class, whilst 2,597 houses of an inferior sort contained 9,206 inhabitants, and 2,868 persons were living in 792 huts. There were, therefore, on the average 3·7 persons in each of the better sort of houses and 3·5 residents in houses of an inferior description, whilst each hut contained on an average 3·6 persons. If these figures are correct, each house does not appear at first sight to be overcrowded, but on inspection houses in some of the mohollas occupied by the poorer classes were seen to be much overcrowded. The houses facing the principal streets preserve regularity as regards the frontages, although no uniformity has been observed as regards elevation; but in the poorer mohollas no attempt of regularity of any kind has been made, and the houses have been built where the original squatters first encamped, so that these mohollas form complete labyrinths.

The main street runs from north to south, and at right angles to it there are streets running east and west. These have been for the most part metalled; but the numerous lanes in the heart of the bázár are unmade and very tortuous, although the general direction runs east and west, but many of them end in a *cul de sac*. The better sort of houses stand on a fairly raised plinth, but the great majority are level with the ground surface, and in some instances the floors of the houses are below the street level. 2,994 of the houses are roofed with slab stones or have flat roofs covered with mud or chunam, whilst 1,221 are tiled and 842 are thatched. The principal means of ventilation provided is through the doors, and even in the better sort of houses the windows, as a rule, are extremely narrow and small, so that the ventilation in them must be very imperfect, and in the poorer houses there is no means of escape for the foul air but through the tiles. This absence of proper means of ventilation is much to be regretted, as it must make the people living in them unhealthy.

It is a great pity that in laying out the Sadar Bázár regularity as to buildings in plots was not observed, as now this cannot be remedied, and the tortuous nature of the passages through some part of it renders effective sanitation a matter of extreme difficulty. The bázár is divided into different mohollas in which, generally speaking, persons of the same caste reside. The wealthiest and more respectable classes have their residences on either side of the main street, whilst the poorer classes are on the outskirts, the lowest castes being located on the east. In each moholla is a public latrine for the use of the residents.

The drainage of the bázár is surface, and the storm water is carried off by a large unpaved nála which starting from the diggee on the north-west passes between the Sadar Bázár and the officers' compounds to a diggee on the south behind the Executive Commissariat Officer's house, which also receives the drainage from the road-side on the east of the Mall. Below this is an old stone quarry which has been turned into a tank, now called the

Killarney Khudder, where the buffaloes from the town are watered. Formerly all the road-side drains in the Sadar Bázár were closed and covered with stone slabs, but lately much good work has been effected by substituting open cut stone drains with a flat invert and sloping sides. 10,424 feet of such open drains have been provided. There are, however, 2 or 3 streets where the old drains still remain, though these are immediately to be taken in hand and converted into open drains. They are extremely dangerous, as they extend in front of the houses on either side, and the people have built a continuous platform over the stone slabs which form a very convenient place for them to expose their wares for sale; but this arrangement renders any attempt at cleaning an impossibility, and much filth is, of course, collected in them. In some places, as Ramdial's Moholla and Besoute Oolla, it was noticed that although a new saucer drain had been made, the old drains had not been filled in, and in many cases the old house connections still discharge into the old drains, or the liquid refuse brought from them soaks into the soil. This is so manifestly wrong that instant action should be taken to put a stop to so dangerous a procedure. The storm water falling on the east of the bázár is carried off by a lane which is called the Mokeeria Moholla nála which starts from Hawa Chakee and is discharged into the main nála on the west at Khatar Wallee. This nála the Cantonment Magistrate intends very shortly to pave, which will be a very great improvement.

The drinking water-supply for the bázár is principally derived from a diggee on the north-west at the entrance of the bázár. The cattle before being driven out to graze, collect on the gathering ground in the morning, and as its surface is very impure, the first washings of this ground must be simply sewage. At this diggee hundreds of persons, Hindus and Mussulmen, draw their drinking water. A sepoy is posted on the steps leading into it to prevent people bathing in it. Another source is from a well which is in the compound adjacent to the diggee. Another principal source is the diggee on the south and from well between it and Killarney Khudder, which is reserved for persons of caste. The low-caste Chammars draw their supply from the Tadiwala's (the Swami of the Chammars) well, which is a few yards distant. There is also a well on the east near Kanjarpoora which is used by the low-caste people in that locality. Besides the above there are 13 private wells used for drinking water, but they are all open to suspicion. Twenty-five of the wells in the bázár are brackish and not available for drinking.

The scavengering establishment works under the orders of the Cantonment Magistrate. A Sergeant is appointed to look after the conservancy of the officers' quarters, barracks, roads in camp, who also inspects the Commissariat and bázár slaughter-houses, bakeries, &c.

The conservancy of the bázár is entirely under Native supervision. The scavengering establishment consists of 5 mukádams, 94 male and 47 female sweepers, 2 drain sweepers, 15 carts and 32 buffaloes, and is thus distributed:—

	Sadar Bázár.	Officers' Bungalows.	European Infantry Regiment.	Artillery.	Native Infantry.	Cavalry.	Slaughter-houses.	Total.
Mukádams	2	1	1	1	...	...	...	5
Sweepers, male	48	19	9	10	3	3	2	94
Do. female	35	4	1	...	6	1	...	47
Carts with 2 bullocks	1	...	1	1	...	...	...	3
Do. 1 bullock	8	3	...	1	...	...	...	12
Buffaloes	32	...	...	...	...	...	...	32

The dry refuse is carted away to the Sadar Bázár manure yard, which is about three quarters of a mile on the south-east of camp, where it is sold to cultivators who, for a fee of Rs. 10, are allowed to cart away during the year as much as one cart can hold. Rs. 317 were collected last year by the sale of this rubbish.

There are 214 privies attached to houses in the bázár. An earthen receptacle, into which ashes are placed, catches the filth. This is placed in an iron receptacle by the sweeper and afterwards emptied into the cart. There are 34 public latrines which are of faulty construction. They consist of masonry set in mortar and limewashed. The foot-rests consist of slabs of stone, and the seats are raised, so that the flooring falls away from them in front, an arrangement made to allow the urine and ablution water to flow down through a gutter between the foot-rests to an earthenware vessel sunk in the masonry which is cleaned by the mehter. The seats for males are partitioned off from each other by low walls, so that in them there is some attempt at privacy; but the places for women consist of one long row of open seats, which, however, are not so much used as the surface of the ground within the enclosure. One good thing about these latrines is that they have no roof, and the smell from them is consequently much less than might be expected. There are also 82 open urinals in the bázár which have been placed in convenient nooks and corners, but many of these places are not unnaturally used as latrines. The ground, too, in all the poorer quarters of the bázár is soaked with urine, and there was plenty of evidence that persons had squatted close to their doors in many of the poorer mohollas. The night-soil establishment consists of 105 private sweepers, 44 public sweepers, 27 night-soil carts and 13 halálkhor bhistis, and is thus distributed:—

	Officers' Quarters.	Bázár.	European Infantry.	Artillery.	Native Infantry.	Cavalry.	Commissariat.	Executive Engineer.	Total.
Carts with 2 bullocks for removing receptacles to Sadar Bázár manure yard	...	...	...	1	1	...	...	...	2
Do. do. to Dilwarra do.	...	...	2	...	...	...	...	...	2
Carts with one bullock to Sadar Bázár manure yard ...	3	7	...	...	...	...	...	...	10
Sweepers, male	26	20	9	1	...	...	1	1	58
Do. female...	7	58	1	...	...	...	...	1	67
Halálkhor Bhistis	...	2	9	2	...	...	...	...	13
Carts, 2 bullocks, for urinals ...	...	...	...	...	1	...	...	...	1
Do. 1 bullock...	...	9	...	...	...	...	...	...	9
Hand carts for night-soil from private houses...	...	3	...	...	...	...	...	...	3

The night-soil is taken to the manure yard on the south-east of the bázár and is buried in trenches, the digging of which is performed by the servants of a contractor, but 2 bildárs are employed in covering it with earth when deposited in the trench. The night-soil of the Artillery is also taken here, but that from the European Infantry Regiment is taken to trenches on the north-east of camp, about a quarter of a mile from the Ajmere road and about three quarters of a mile in front of Dilwarra village, where a bildár buries it in trenches prepared by a contractor. Two bildárs are employed in burying the night-soil from the Cavalry tatties in the ground adjacent to them. Three bildárs are also employed in burying the night-soil of the native followers of the Artillery near the Native Infantry tatties and near the railway behind the haystack, and 8 perform the same duty for the Native Infantry. Two bildárs are employed on the east of the bázár where the night-soil from the Kanjarpoora and the Commissariat tatties is buried, at a site near which in former days was the Picket Guard, or, as the natives still call it, the Phánsi Guard, as criminals were in the old days hung near here and where about 24 mutineers were shot in 1858. The trench system in Nasirabad is exceptionally well carried out, and great praise is due to those concerned. The trenches are, after lying fallow for some time, ploughed up cross-wise and the ground cultivated.

No offensive trades are permitted to be carried on within the limits of the bázár, except a few indigo dyers. There are 4 bakeries in Besoute Oolla where

bread for Europeans is made. They are all objectionable, though the premises of Sunnoo bin Khoja Baksh, the baker who supplies the officers, were as clean as they could be kept. The water with which the yeast is mixed, is drawn from either the diggee or the public well near it.

The mutton and beef slaughter-houses are situated on the north-east and south-east of the bázár. At the mutton slaughter-house there are 2 enclosures surrounded by a compound wall which are paved on a slope from the centre where the animals are slaughtered on alternate days. The blood runs down to a cistern placed outside, whence it is removed by a cart. About 18 sheep and 12 goats are slaughtered here daily, and the general arrangements as regards cleanliness are good. Near and to the north-east of the mutton slaughter-house on the open plain is the mutton market—a handsome stone building—which contains 20 stalls. The beef slaughter-house is on the south-east of the bázár. It is similar in construction and design to the mutton slaughter-house, and about 19 head of cattle are daily slaughtered. There is no beef market; but the beef is sold in Kussai Moholla in the butchers' shops. The Commissariat slaughter-house, where the animals for the troops are slaughtered, is still further to the south. About 40 sheep and 12 head of cattle are slaughtered during the week. It is paved and kept very clean. The hanging shed is in a separate building at some distance from the slaughter-house. It is kept clean, but is not of modern construction.

There is no fruit and vegetable market, and the vendors sit along each side of the main street. The vegetables are brought from villages all round.

One of the greatest dangers to the public health in the Sadar Bázár is the condition of the houses and yards where animals are kept, of which there are a large number, as will be seen from the following return:—

Camels.	Horses and Mares.	Ponies.	Milch Buffaloes.	Bull Buffaloes.	Cows.	Bullocks.	Sheep and Goats.	Total.
50	90	64	300	5	589	972	2,500	4,570

These animals are tethered close alongside the houses of the owners, and they add to the filthy condition of the surface very considerably. A large number of buffaloes are kept in the houses on the west of the bázár and immediately adjoining the officers' quarters. On the east the Ahirs keep their animals near Hawa Chakee and on the south the Jats in Kharee-che-Moholla.

The burial grounds for the different communities are as follows, the return being supplied by the Cantonment Magistrate:—

Burial grounds.	Number.	Position as regards Station.	How long opened.	Number of Burials in 1881.
Christians	1	South-west ...	64 years ...	3
Jews	1	Do. ...	9 „ ...	...
Mohamedans...	1	North-west ...	64 „ ...	149
		South-west ...	4 „ ...	
Hindu Cremation Ghát	1	East	65 „ ...	238
Others	1	North-east ...	12 „ ...	257

The Hindu burning ghát is situated near an irrigation tank on the east, whence called the Bhootia Kheree. There is a Pársee Tower of Silence situated on a hill about 5 miles from the Cantonment on the west of the Ajmere road.

I learn from the Cantonment Magistrate that 468 persons were summoned during 1881 for breaches of the Cantonment rules, and that the sum of Rs. 481-7-9 were collected on account of fines. The offences for which these

fines were inflicted cannot be given, as the office files are not available, but 38 persons were punished for having dirty houses, 69 for depositing filth in streets and roads, and 143 for committing nuisances.

Such is a brief description of the Sadar Bázár; and I learn from the returns kindly forwarded to me by Captain Newill, the Cantonment Magistrate, that the number of deaths registered in the following years was as follows:—

Years.	Males.	Females.	Total.	Ratio of Deaths per 1,000.
1876	316	246	562	30·69
1877	353	281	634	34·62
1878	485	393	878	47·95
1879	515	468	983	53·68
1880	377	366	743	40·58
1881	348	299	647	35·33

The different causes of deaths are shown in the next return:—

Years.	Cholera.		Small-pox.		Fever.		Bowel Complaints.		All other.		Total.		Grand Total.
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	
1876	...	...	...	..	100	109	3	6	213	131	316	246	562
1877	...	...	21	18	143	106	6	8	183	149	353	281	634
1878	5	3	6	4	220	194	5	3	249	189	485	393	878
1879	...	...	14	31	241	233	45	26	215	178	515	468	983
1880	...	...	42	41	139	173	49	31	147	121	377	366	743
1881	...	...	1	1	127	138	37	17	183	143	348	299	647
Total ...	5	3	84	95	970	953	145	91	1,190	911	2,394	2,053	4,447

It will be remarked that the death-rate in each of the 6 years has been extremely high, and that in 1879 it attained the excessively high ratio of 53·68 per 1,000 of population. Only 8 deaths during the 6 years are attributed to cholera, and these occurred in 1878. The fever death-rate in '78 and '79 was abnormally high, and this points to preventible causes. With such death-rates as shown in the first table the sanitary state of the Sadar Bázár cannot be considered in a satisfactory condition. The deaths were recorded to have taken place at the following ages:—

	Under 1 year.		1 and under 6 years.		6 and under 12 years.		12 and under 20 years.		20 and under 30 years.		30 and under 40 years.		40 and under 50 years.		50 and under 60 years.		60 and upwards.		Total.		Grand Total
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	
1876	136	106	69	46	4	4	18	9	17	15	20	16	25	16	17	18	27	15	316	246	562
1877	165	125	73	56	13	4	7	11	20	28	23	10	22	6	15	18	17	21	353	281	634
1878	187	147	80	69	9	9	10	26	41	37	44	35	41	21	28	29	45	49	485	393	878
1879	141	134	139	126	16	19	18	29	57	39	41	49	49	43	50	26	26	37	515	468	983
1880	115	127	75	106	12	9	16	15	44	19	44	18	27	16	19	30	25	26	377	366	743
1881	154	127	33	26	5	6	15	22	34	30	31	8	22	23	34	17	20	28	348	299	647
Total	898	766	469	453	59	51	73	103	213	158	199	97	177	129	163	138	160	169	2,394	2,053	4,447

From this I have deduced the following table:—

Year.	Number of Deaths under 12 years of age.	Number of Deaths above 12 years.	Percentage of Infant to Adult Mortality.
1876...	356	206	172·82
1877...	438	196	219·40
1878...	501	377	132·89
1879...	547	436	125·46
1880...	442	301	176·84
1881...	363	284	127·81
Total ...	2,647	1,800	147·05

This table is most instructive, and teaches us that the heaviest mortality takes place among the children. These figures alone prove the defective system of sanitation in the Sadar Bázár, as the mortality among the young is the surest test of the presence of unsanitary conditions, such as an impure atmosphere or water-supply.

The deaths according to caste are thus classified:—

Year.	Europeans.		Native Christians.		Mussalmáns.		Hindus.		Pársis.		Others.		Total.		Grand Total.
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	
1876	...	...	...	...	92	46	116	91	1	...	107	109	316	246	562
1877	...	1	...	1	74	56	157	107	...	...	122	116	353	281	634
1878	...	...	1	...	106	71	210	202	1	...	167	120	485	393	878
1879	...	...	1	1	122	109	232	208	...	1	160	149	515	468	983
1880	1	...	2	2	86	79	151	136	...	...	137	149	377	366	743
1881	...	...	2	1	76	73	129	109	...	...	141	116	348	299	647
Total ...	1	1	6	5	556	434	995	853	2	1	834	759	2,394	2,053	4,447

The number of births registered during the same years was as under:—

Year.	Births registered.		Total.	Ratio of Births per 1,000.
	Boys.	Girls.		
1876	435	395	830	46·7
1877	504	450	954	52·1
1878	406	379	785	41·1
1879	282	271	553	31·08
1880	405	445	850	47·4
1881	543	517	1,060	57·82
Total ...	2,375	2,457	5,032	...

These figures appear to me to be very high, but I am informed that there is no doubt as to their accuracy, as whenever a birth or death takes place one of the members of the family in whose house it has occurred reports the circumstance within 24 hours of the event to the Chaukidári Tax Daroga at the Chowdhrat who has charge of the birth and death registration. Any one failing to report

within 24 hours is liable to be punished by the Cantonment Magistrate under Rule 69 of Cantonment Rules on a receipt of a report through the Moholla Chaukidárs. This system is said to work well, and I am informed that no birth or death escapes registration. As a further check on the death registration, the sweeper who receives the clothes of the deceased person reports the occurrence at the Chowdhrat.

There is a permanent vaccinator kept up by the Cantonment Committee who is allowed an assistant in the case of an outbreak of small-pox. The vaccinator goes round daily to the houses to find out where unvaccinated children are, and the Staff Surgeon superintends his work. The following return shows the amount of work done in the Cantonment since 1876 :—

Year.	Number of Children vaccinated during the year.		Number of Children revaccinated.		Successful.		Unsuccessful.		Insusceptible.		Total.
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	
1876	274	269	...	...	241	243	33	26	177	140	860
1877	446	449	6	5	434	390	68	64	33	33	1,083
1878	313	237	...	...	495	...	53	...	...	...	548
1879	190	163	13	4	150	118	17	21	10	20	353
1880	435	424	14	16	196	200	253	240	...	...	919
1881	522	453	3	2	358	336	23	37	144	82	985
Total ...	3,180	1,995	36	27	1,379	1,287	394	388	364	375	4,698

The following statement shows the details of receipts and expenditure of the Cantonment Fund. The Chaukidári tax on bangalows is levied under Act XX. of 1856, the pound fees under Act I. of 1871, the Cantonment octroi tax under Section 39 of the Ajmere Laws Regulation, 1877, as per Notification of the Chief Commissioner, Ajmere Merwarra, No. 302 of 16th May 1881 :—

Statement of Details of Receipts and Expenditure of Cantonment Fund for 1881.

Receipt.	Amount.	Total.	Expenditure.	Amount.	Total.
	Rs. a. p.	Rs. a. p.		Rs. a. p.	Rs. a. p.
Chaukidári Tax ...	1,234 8 0		Conservancy Bázár ...	3,189 4 3	
Octroi Collections ...	26,015 0 9		Do. Station ...	1,995 3 9	
Pound Fees	525 3 3		Cantonment Fund ...	2,259 11 7	
Fines for breach of Cantonment Rules ...	478 15 6		Octroi	3,334 4 11	
Grazing Fees	3,242 4 0		Cemetery	100 0 0	
Cultivation Fees ...	3,458 2 3		Hospital and Dispensary.	440 5 3	
Slaughter House Fees ...	1,356 0 0		Lock Hospital	2,298 11 7	
Other Items	2,896 2 7		Latrines, Public ...	835 15 9	
			Lighting Bázár Roads ...	1,667 7 9	
			Do. Band Stand ...	96 0 0	
			Market	946 11 9	
			Pound	146 15 3	
			Police	4,252 8 0	
			Planting and watering Trees	2,276 2 6	
			Public Works	7,995 3 11	
			Slaughter Yard	106 0 4	
			Station Garden	1,209 3 3	
			Miscellaneous	3,009 0 11	
Total Rs. ...		37,176 4 4	Total Rs. ...		36,139 12 0

The recommendations that I have the honour to make regarding the Sadar Bázár are the following :—

The immediate introduction of properly filtered Danta water into the Sadar Bázár is, I consider, *most imperative*, as the present sources are

most impure, and in my opinion the high death-rate is to be ascribed in a great degree to the extremely impure water the people now drink. If this supply, when supplemented with the Bir tank water is made available, it would be possible to introduce a pipe sewerage scheme which would carry off all the night-soil, ablution water, and water used for washing purposes to the fields in the south-east, which are especially fitted for a farm. But as this scheme could not be carried out for some time, in the meantime I strongly recommend the abolition of the present faulty public latrines and the substitution of latrines on what is known as Colonel Goodfellow's or the Kárwár pattern. In this latrine, which is much cheaper than any others, I would for this climate suggest the abolition of the roof, which is not necessary. A full description of it has been given by Mr. Lumsdaine in his Annual Sanitary Report for 1879, Section VI, p. 11, para. 19, of which the following is an extract:—

"*Kárwár Pattern Latrine.*—Another form of latrine is that put up for the Kárwár High School by Colonel Goodfellow, V.C., R.E., and it has been such a success that now, after some years of trial, it may safely be recommended for general adoption. In its simplest form, it may almost be described as a receiving vessel just sufficiently covered in for privacy and shelter. There are 4 corner posts, bamboo battens, and a pent roof, a couple of stones serve for foot-rests, and between them is a receiving vessel. There can be nothing more simple, and more serviceable, for there is really nothing to get out of gear. Neither costly nor perishable masonry to become tainted and fouled, no chunam to be still more offensive, nor a carrier shoot that must choke: and the receiving vessel may either be used as an ordinary commode, and emptied frequently, or the dry-earth system may be adopted; should there be a trace of soakage the entire floor can be dug up and renewed. At moderate cost it might occupy the most prominent positions, and it can easily be so modified as to connect with a sewer. There is no reason why it should not be introduced for European troops, for the position it entails is that adopted in marching and on field service; indeed, the filthy condition of the seat very frequently enforces it in hotels and Railway stations, steamers and such like places, and it is soon acquired, and when acquired is not irksome. At increased outlay it may be made to suit the best houses: the corner posts might be of square teak, hoop iron lattice-work or louvres might replace the bamboo battens, and there might be patent tiles instead of corrugated iron, and the receiving vessel could be of copper or zinc, or glazed stoneware. A strong point in favour of these latrines is their cheapness: they can be run up for Rs. 25 per seat, whilst the other range from Rs. 34 to Rs. 71. For sewered cities, however, there are perhaps no more suitable public latrines than those of iron with segmental troughs well trapped, and the best, in my opinion, are those made by Jennings of Lambeth: they can be made with louvres instead of brick-work. In rural districts the main points to be looked to are an impervious receiving vessel, a superstructure through which the wind can blow freely, and the *absolute* absence of chunam and masonry of any kind."

The removal of all cattle from the interior of the bázár and their location in stables erected on an approved plan on the east is extremely desirable. This measure would probably be met by violent opposition on the part of the owners; but the high death-rate that has for so many years past prevailed, speaks in clear language, and warns us that such infraction of sanitation cannot be continued without the greatest danger to the public health. If this measure cannot be carried out, then I recommend that, wherever more than 3 animals are collected, the surface of the ground be paved and drained, and that the owners be made to remove the cow-dung and urine outside and no longer be allowed to make cow-dung cakes inside the bázár; and most stringent measures should be adopted to prevent these animals being fed with the litter from the Cavalry and Artillery.

The erection of a beef market is much required, and the bakers who supply Europeans should be compelled to build proper bakeries, which should not be in the centre of the town.

Steps should be taken to improve the ventilation of the huts by compelling the owners to leave an opening in the roof, similar to those used for cook-houses in officers' quarters, or other means for the egress of foul air; and no new house should be built until the sanitary arrangements had been approved by the Cantonment Committee.

The extension of metalled roads among the poorer quarters of the town is most desirable, and endeavours should be made to pave some of the lanes, and people ought not to be allowed to defile the public streets in the way they now do. In a sanitary point of view the most important places to inspect are the quarters occupied by the lowest castes, as they receive the least attention;

and I should strongly advise that an European Inspector be appointed for supervising the conservancy of the bázár, as Natives, however good, have not had the early training that Europeans have regarding cleanliness.

In my opinion it is absolutely important that all the sweepers should be declared public servants and that the Cantonment Committee should undertake the cleaning of all private privies. If this were done, it would be necessary of course to impose a halálkhor cess.

I also think that the European cemetery being directly to windward of the railway and the barracks should be closed and that a fresh one be made on the east. This burial ground has been in use since the time the Cantonment was made in 1818. If this is closed of course the Jewish burial ground should be closed also.

In concluding this report I must express my best thanks to the various officers who kindly accompanied me at my inspections and gave me whatever assistance I required. I am greatly indebted to Surgeon-Major Chapman and Captain Newill for the valuable aid they afforded me, but especially to Major Murray, who not only accompanied me at many of my inspections, but who took the greatest trouble to place at my disposal the fullest information on all subjects connected with my enquiry which pertained to his Department.

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1876.

Months.	Corps G 4th Brigade, R. A.: Average Strength 149·91.																68th Regiment Light Infantry: Average Strength 518.													
	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All other Causes.		Cholera.		Enteric Fever.		Malarial Fevers.						Dysentery.		Diarrhœa.		All other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.												Intermittent.		Remittent.		Continued.		Total Malarial Fevers.					
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January	...	...	...	...	3	...	...	...	...	...	3	...	...	...	2	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
February	...	...	...	...	2	...	...	...	2	...	4	...	...	...	2	...	2	...	...	...	...	...	12	...	1	...	...	...	13	...	1	...	9	...
March	...	...	...	...	...	...	...	...	2	...	2	...	...	...	...	...	2	...	...	...	...	...	8	...	...	...	1	...	9	...	1	...	12	...
April	...	...	...	...	5	...	...	...	...	...	5	...	...	...	...	...	1	...	...	...	...	...	8	...	...	...	1	...	9	...	6	...	13	...
May	...	...	...	...	4	...	...	...	1	...	5	...	1	...	1	...	3	...	...	...	...	...	11	...	...	...	...	...	11	...	1	...	23	...
June	...	...	...	...	5	...	...	...	1	...	6	...	...	...	...	...	6	...	...	...	...	...	4	...	...	...	...	...	4	...	...	...	22	...
July	...	...	...	...	3	...	...	...	...	...	3	...	...	...	...	...	8	...	...	...	...	...	7	...	...	...	4	...	11	...	3	...	14	...
August	...	...	...	...	8	...	...	...	...	...	8	...	...	...	4	...	3	...	...	...	...	...	18	...	1	...	2	...	21	...	3	...	19	...
September	...	...	...	...	13	...	...	...	4	...	16	...	2	...	4	...	12	1	...	...	...	...	22	...	...	...	1	...	23	...	5	...	13	...
October	...	...	...	...	20	...	2	...	...	...	22	...	2	...	...	...	5	1	...	...	...	...	38	...	1	...	1	...	40	...	1	...	13	...
November	...	...	...	...	30	...	...	...	...	...	30	...	...	...	...	...	4	...	...	...	...	...	37	...	...	...	2	...	39	...	1	...	21	...
December	...	...	...	...	13	...	...	...	2	...	15	...	...	...	1	...	4	...	...	...	...	...	14	...	...	...	4	...	18	...	6	...	16	...
Total	...	...	...	...	105	...	2	...	12	...	119	...	5	...	16	...	54	2	...	...	6	...	179	...	3	...	12	...	194	...	19	...	28	...	175	...
Admitted per 1,000 of Strength	...	...	...	...	700·42	...	13·34	...	80·04	...	793·33	...	33·35	...	106·73	...	353·54	...	...	...	11·5	...	345·5	...	5·7	...	22·1	...	374·52	...	36·6	...	54·0	...	337·8	...

1877.

Months.	G Battery, 2nd Brigade, R. A.: Average Strength 161·9.																68th Regiment Light Infantry: Average Strength 465·5.													
	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All other Causes.		Cholera.		Enteric Fever.		Malarial Fevers.						Dysentery.		Diarrhœa.		All other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.												Intermittent.		Remittent.		Continued.		Total Malarial Fevers.					
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January	...	...	...	...	4	...	...	...	...	...	4	...	...	...	...	...	7	...	...	...	...	...	8	...	1	...	1	...	10	...	2	...	2	...	6	2
February	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	2	...	...	...	...	...	6	...	...	...	...	...	6	...	...	...	12	...
March	...	...	...	...	2	...	...	...	...	...	2	...	...	...	2	...	10	...	...	...	...	...	5	...	...	...	2	...	7	...	3	...	6	...
April	...	...	...	...	2	...	...	...	1	...	3	...	...	...	...	...	4	...	...	...	...	...	6	...	...	...	...	...	6	...	...	...	8	...
May	...	...	...	...	1	...	...	...	1	...	2	...	1	...	...	...	7	...	...	...	...	...	13	...	...	...	...	...	13	...	1	...	6	...
June	...	...	...	...	5	...	...	...	2	...	7	...	...	...	2	...	7	...	...	...	...	...	15	...	...	...	2	...	17	...	1	...	8	...
July	...	...	...	...	5	...	...	...	1	...	6	...	...	...	1	...	2	...	...	...	...	...	19	...	...	...	...	...	19	...	2	...	9	...
August	...	...	...	...	10	...	...	...	1	...	11	...	...	...	1	...	6	...	...	...	...	...	17	...	...	...	...	...	17	...	3	...	7	...
September	...	...	...	...	8	...	...	...	1	...	9	...	...	...	...	...	4	...	...	...	...	...	22	...	...	...	1	...	23	...	1	...	9	...
October	...	...	...	...	3	...	...	...	1	...	4	...	...	...	1	...	7	...	...	...	...	...	7	...	...	...	...	...	7	...	3	...	11	...
November	...	...	...	...	2	...	...	...	...	...	2	...	...	...	...	...	7	...	...	...	...	...	6	...	...	...	...	...	6	...	1	...	10	...
December	...	...	...	...	3	...	...	...	1	...	4	...	1	...	...	...	4	...	...	...	...	...	3	...	...	...	1	...	4	...	...	...	11	...
Total	...	...	...	...	55	...	...	...	8	...	55	...	2	...	9	...	63	...	...	...	...	...	128	...	1	...	13	...	142	...	18	...	27	...	103	2
Admitted per 1,000 of Strength	...	...	...	...	339·7	...	...	...	49·4	...	341·7	...	12·3	...	55·5	...	389·3	...	...	...	...	...	274·97	...	2·14	...	27·92	...	305·38	...	38·65	...	58·00	...	221·26	...

1878.

G. Battery, 2nd Brigade, R. A.: Average Strength 155·5.

Months.	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.							
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January	...	...	...	...	4	...	...	...	...	...	4	...	1	...	2	...	2	...
February	...	...	...	...	2	...	...	...	...	...	2	...	1	...	1	...	4	...
March	...	...	...	...	3	...	...	...	...	...	3	...	...	...	2	...	4	...
April	...	...	...	...	3	...	...	...	...	...	3	...	1	...	1	...	4	...
May	...	...	...	...	1	...	...	...	1	...	2	...	2	...	...	...	7	...
June	...	...	...	...	2	...	...	...	1	...	3	...	1	...	1	...	4	...
July	...	...	...	...	9	...	...	...	2	...	11	...	...	...	2	...	4	...
August	3	3	...	...	21	...	...	...	...	...	21	...	1	...	1	...	6	...
September	1	...	...	...	22	...	1	...	...	...	23	...	1	...	6	1	6	1
October	...	...	...	...	41	...	...	...	...	...	44	...	3	...	2	...	5	...
November	...	...	...	...	40	...	1	...	...	...	41	...	...	...	1	...	6	...
December	...	...	...	...	10	...	...	...	...	...	10	...	...	...	2	...	2	...
Total	4	3	...	...	161	...	2	...	4	...	167	...	11	...	21	...	53	1
Admittel per 1,000 of Strength	25·8	...	...	...	1,038·7	...	12·9	...	25·9	...	1077·4	...	71·6	...	135·6	...	341·9	...

68th Regiment Light Infantry: Average Strength 451.

Months.	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All Other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.							
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January	...	...	...	...	2	...	...	...	...	...	2	...	1	...	1	...	5	...
February	...	...	...	...	8	...	1	...	...	...	9	...	...	...	...	...	9	...
March	...	...	...	...	6	...	...	...	...	...	6	...	2	...	...	...	10	...
April	...	...	...	...	14	...	...	...	...	...	14	...	2	...	5	...	11	...
May	...	...	...	...	8	...	...	...	...	...	8	...	1	...	5	...	9	...
June	...	...	...	...	6	...	...	...	...	...	6	...	...	...	2	...	17	...
July	...	...	...	...	26	...	...	...	...	...	26	...	...	...	5	...	14	...
August	...	...	...	...	42	...	...	...	6	...	42	...	6	...	8	...	11	1
September	7	7	...	...	91	...	2	...	...	...	91	...	...	...	7	...	6	...
October	2	2	...	...	117	...	...	1	...	2	117	1	1	...	...	...	14	...
November	...	...	...	...	4	...	...	...	...	...	4	...	1	...	...	...	...	...
December	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Total	9	9	...	...	324	...	3	1	2	...	329	1	14	...	33	...	106	1
Admittel per 1,000 of Strength	19·95	...	...	...	718·4	...	6·65	...	4·43	...	729·5	...	...	...	73·17	...	235·06	...

1879.

E. Battery, 2nd Brigade, R. A.: Average Strength 113.

Months.	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All Other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.							
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January	...	...	...	...	51	...	...	...	...	...	51	...	...	1	...	...	28	...
February	...	...	...	...	18	...	...	...	...	...	18	...	...	...	3	...	17	...
March	...	...	...	...	18	...	...	...	...	...	18	...	...	...	5	...	13	...
April	...	...	...	...	14	...	1	...	...	...	15	...	1	1	4	...	10	1
May	...	...	...	...	34	...	...	...	...	...	34	...	...	...	3	...	19	...
June	...	...	...	...	22	...	...	...	1	...	23	...	...	...	4	...	14	...
July	...	...	...	...	12	...	...	...	2	...	14	...	...	...	5	...	16	...
August	...	...	...	...	17	...	...	...	...	...	17	...	2	...	2	...	16	1
September	...	...	...	...	23	...	1	...	...	...	24	...	2	1	1	...	18	1
October	...	...	...	...	22	...	...	...	1	...	23	...	2	1	6	...	22	...
November	...	...	...	...	15	...	1	1	...	...	16	1	...	...	2	...	5	...
December	...	...	...	...	7	...	...	...	...	...	7	...	...	...	...	...	13	...
Total	...	...	...	...	252	...	3	1	4	...	259	1	5	3	35	...	191	3
Admitted per 1,000 of Strength	...	...	...	...	2230·1	...	26·5	...	35·4	...	2292·0	...	...	...	...	...	1691·7	...

H. M.'s 2/17th Regiment: Average Strength 474.

Months.	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All Other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.							
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January	...	...	...	...	16	...	...	...	...	...	16	...	...	...	...	...	56	...
February	...	...	...	...	10	...	...	...	...	...	10	...	3	...	1	...	42	...
March	...	...	...	...	31	...	...	...	...	...	31	...	2	...	2	...	45	1
April	...	...	...	...	19	...	2	1	1	...	22	1	1	...	...	...	50	...
May	...	...	...	...	44	...	1	...	...	...	45	...	1	...	1	...	49	1
June	...	...	...	...	54	...	...	...	...	...	54	...	1	...	...	...	26	...
July	...	...	...	...	41	...	...	...	...	...	41	...	1	...	1	...	31	...
August	...	...	2	2	59	...	3	1	...	...	62	1	5	...	2	...	36	3
September	...	...	1	1	76	...	3	...	...	...	79	...	6	...	3	...	40	1
October	...	...	3	1	90	...	...	...	...	...	90	...	10	1	2	1	54	1
November	...	...	1	1	58	...	...	...	1	...	59	...	7	...	4	...	44	2
December	...	...	1	1	29	...	1	...	...	...	30	...	4	...	1	...	57	1
Total	...	...	8	6	527	...	10	2	2	...	539	2	41	1	17	1	530	10
Admitted per 1,000 of Strength	...	...	16·9	...	1111·8	...	21·1	...	4·2	...	1137·1	...	86·5	...	35·9	...	1118·1	...

1880.

Months.	E. 2 Royal Artillery: Average Strength 129·84.																2/17th Regiment: Average Strength 495·11.															
	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All Other Causes.		Cholera.		Enteric Fever.		Malarial Fevers.						Dysentery.		Diarrhœa.		All Other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.												Intermittent.		Remittent.		Continued.		Total Malarial Fevers.					
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January	...	...	...	...	4	...	...	...	...	...	4	...	1	...	2	...	2	...	...	...	...	...	11	...	...	...	...	...	11	...	2	...	1	...	11	...
February	...	...	...	...	4	...	...	...	...	...	4	...	3	...	...	...	9	...	...	...	...	...	6	...	...	...	...	...	6	...	1	...	2	...	6	...
March	...	...	...	...	3	...	...	...	...	...	3	...	...	...	...	...	11	2	...	...	...	...	11	...	...	...	...	...	11	...	1	...	...	...	5	...
April	...	...	...	...	3	...	...	...	...	...	3	...	...	...	...	...	6	...	...	...	...	...	26	...	...	...	...	...	26	...	...	...	...	...	6	...
May	...	...	...	...	2	...	...	...	...	...	2	...	...	...	...	...	11	...	...	...	...	...	35	...	...	...	...	...	35	...	...	...	4	...	10	...
June	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	15	...	...	...	...	...	15	...	...	...	1	...	18	...
July	...	...	...	...	4	...	...	...	...	...	4	...	...	...	3	...	7	...	...	...	...	...	15	...	1	...	1	1	17	1	1	...	14	...	5	...
August	...	...	...	...	5	...	...	...	...	...	5	...	...	...	3	...	11	...	...	...	...	...	25	...	...	...	2	...	37	...	1	...	13	...	17	...
September	...	...	...	...	6	...	...	...	...	...	6	...	2	...	...	...	8	...	...	...	1	1	29	...	1	...	6	...	36	...	2	...	4	...	16	...
October	...	...	...	...	4	...	...	...	...	...	4	...	...	...	2	...	5	...	...	...	1	1	22	...	...	...	6	...	28	...	...	...	3	...	6	...
November	...	...	...	...	2	...	...	...	...	...	2	...	...	...	...	...	3	...	...	...	...	...	11	...	...	...	6	...	17	...	...	...	1	...	8	...
December	...	...	...	1	3	...	...	...	...	...	3	...	...	...	...	...	4	...	...	...	2	2	22	...	...	...	3	...	25	...	...	...	1	...	3	...
Total	...	...	1	1	40	...	...	...	...	...	40	...	6	...	10	...	87	2	...	...	5	5	238	...	2	...	24	1	264	1	8	...	44	...	108	...
Admitted per 1,000 of Strength	...	...	7·61	...	307·69	...	...	...	...	...	307·69	...	46·15	...	76·92	...	647·80	...	...	...	10·10	...	408·08	...	4·04	...	48·48	...	533·3	...	16·2	...	88·8	...	216·16	...

1881.

Months.	E. Battery, 2nd Brigade, R. A.: Average Strength 141.																2nd Battalion, Leicestershire Regiment: Average Strength 473.															
	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All Other Causes.		Cholera.		Enteric Fever.		Malarial Fevers.						Dysentery.		Diarrhœa.		All Other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.												Intermittent.		Remittent.		Continued.		Total Malarial Fevers.					
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	2	...	...	...	...	...	11	...	...	...	2	...	13	...	...	...	4	...	10	...
February	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	9	...	...	...	3	...	12	...	...	...	1	...	11	...
March	...	...	...	...	2	...	...	...	...	...	2	...	...	...	...	...	1	...	...	...	...	...	14	...	...	...	3	...	17	...	...	...	5	...	21	...
April	...	...	...	...	2	...	...	...	...	...	2	...	1	...	2	...	3	...	...	...	...	...	17	...	...	...	2	...	19	...	...	...	5	...	18	...
May	...	...	...	...	8	...	...	...	...	...	8	...	1	...	1	...	14	...	...	...	...	...	12	...	...	...	1	...	13	...	1	...	...	...	30	...
June	...	...	...	...	5	...	...	...	...	...	5	...	...	...	...	...	9	...	...	...	...	...	5	...	...	...	1	...	6	...	11	...	1	...	17	...
July	...	...	...	...	6	...	...	...	1	...	7	...	1	...	...	...	5	...	...	...	...	...	16	...	...	...	7	...	23	...	...	...	1	...	28	...
August	...	...	...	...	12	...	...	...	7	...	19	...	1	...	6	...	13	...	...	...	...	...	53	...	...	...	60	...	113	...	...	...	7	...	20	...
September	...	...	...	...	23	...	...	...	28	...	51	...	2	...	4	...	7	...	...	...	...	...	57	...	...	...	34	...	91	...	4	...	7	...	11	...
October	...	...	...	...	21	...	...	...	...	...	21	...	...	...	...	...	8	...	...	...	5	2	35	...	...	...	28	...	63	...	...	...	1	...	9	1
November	...	...	...	...	6	...	...	...	1	...	7	...	...	...	...	...	2	...	...	...	1	1	42	...	...	...	14	...	56	...	...	...	4	...	8	...
December	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	34	...	...	...	2	...	36	...	...	...	4	...	11	...
Total	...	...	...	...	89	...	...	...	37	...	123	...	7	...	13	...	70	...	...	...	6	3	303	...	...	...	162	...	467	...	5	...	40	...	192	1
Admitted per 1,000 of Strength	...	...	...	...	609·92	...	...	...	262·33	...	872·25	...	49·64	...	92·19	...	496·45	...	...	...	12·7	...	644·8	...	...	...	342·4	...	987·3	...	10·5	...	84·5	...	408·9	...

1876.

Months.	H. M.'s Squadron, 3rd Q. O. Light Cavalry: Average Strength 106·4.																H. M.'s 16th Regiment N. I.: Average Strength.															
	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All Other Causes.		Cholera.		Enteric Fever.		Malarial Fevers.						Dysentery.		Diarrhœa.		All Other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.												Intermittent.		Remittent.		Continued.		Total Malarial Fevers.					
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January ...	...	...	...	...	5	...	...	...	...	...	5	...	1	...	...	...	10	...	...	...	...	...	8	...	...	...	...	...	8	...	...	...	4	...	
February ...	...	...	...	...	7	...	...	...	...	...	7	...	...	...	...	...	2	...	...	...	...	...	46	...	...	...	...	...	46	...	1	...	4	...	
March ...	...	...	...	...	5	...	...	...	...	...	5	...	...	...	...	...	8	...	...	...	...	...	7	...	...	...	...	...	7	...	...	...	4	...	
April ...	...	...	...	...	3	...	...	...	...	...	3	...	...	...	...	...	10	...	...	...	...	...	26	...	...	...	...	...	26	...	...	...	2	...	
May ...	...	...	...	...	3	...	...	...	...	...	3	...	...	...	2	...	12	...	...	...	...	...	31	...	...	...	...	...	31	...	...	...	1	...	
June ...	...	...	...	...	2	...	...	...	...	...	2	...	...	...	1	...	15	...	...	...	...	...	36	...	...	...	1	...	37	...	1	...	1	...	No records.
July ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	7	...	...	...	...	...	29	...	...	...	1	...	30	...	...	...	4	...	
August ...	...	...	...	...	2	...	...	...	...	...	2	...	1	...	1	...	18	...	...	...	...	...	41	...	...	...	...	...	41	...	1	...	15	...	
September ...	...	...	...	...	3	...	...	...	...	...	3	...	4	...	...	...	3	1	...	...	...	...	69	...	...	...	1	...	70	...	4	...	2	...	
October ...	...	...	...	...	18	...	...	...	...	...	18	...	2	...	...	...	5	...	...	...	1	...	144	...	...	...	2	...	146	...	...	...	3	...	
November ...	...	...	...	...	11	...	...	...	...	...	11	...	...	...	...	...	12	...	...	...	...	...	182	...	...	...	...	...	182	...	...	...	1	...	
December ...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	108	...	...	...	...	...	108	...	...	...	13	...	
Total ...	...	...	...	...	62	...	...	...	...	...	62	...	8	...	4	...	103	1	...	...	1	...	727	...	...	...	5	...	732	...	7	...	54	...	
Admitted per 1,000 of Strength ...	...	...	...	...	582·7	...	...	...	...	...	582·7	...	75·2	...	37·5	...	968·0	...	...	...	1·5	...	1,095·3	...	...	...	7·0	...	1102·3	...	10·5	...	81·2	...	

1877.

Months.	H. M.'s Squadron, 3rd Q. O. Regiment, Light Cavalry; Average Strength 1140·7.																H. M.'s 16th Regiment N. I.: Average Strength 632·69.															
	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All Other Causes.		Cholera.		Enteric Fever.		Malarial Fevers.						Dysentery.		Diarrhœa.		All Other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.												Intermittent.		Remittent.		Continued.		Total Malarial Fevers.					
	A.	D.	A.	D.	A	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	57	...	...	...	...	...	57	...	...	...	2	...	8	...
February ...	...	...	...	...	6	...	...	...	...	...	6	...	1	...	...	...	1	...	...	...	...	...	42	...	...	...	...	...	42	...	...	...	...	...	8	...
March ...	...	...	...	...	2	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	9	...	...	...	...	...	9	...	1	...	2	...	10	...
April ...	...	...	...	...	3	...	...	...	...	...	3	...	...	...	1	...	1	...	...	...	...	...	5	...	...	...	...	...	5	...	...	...	1	...	13	...
May ...	...	...	...	...	3	...	...	...	...	...	3	...	...	...	...	...	3	...	...	...	...	...	11	...	...	...	...	...	11	...	...	...	4	...	12	...
June ...	...	...	...	...	4	...	...	...	...	...	4	...	...	...	...	...	4	...	...	...	...	...	19	...	...	...	...	...	19	...	...	...	1	...	15	...
July ...	...	...	...	...	5	...	...	...	...	...	5	...	...	...	...	...	4	...	...	...	...	...	32	...	...	...	...	...	32	...	...	...	3	...	16	...
August ...	...	...	...	...	2	...	...	...	...	...	2	...	2	...	...	...	3	...	...	...	...	...	50	...	...	...	...	...	50	...	...	...	3	...	9	...
September ...	...	...	...	...	6	...	...	...	...	...	6	...	...	...	1	...	3	...	...	...	...	...	31	...	...	...	...	...	31	...	...	...	1	...	15	...
October ...	...	...	...	...	2	...	...	...	...	...	2	...	...	...	1	...	2	...	...	...	...	...	48	...	...	...	...	...	48	...	...	...	1	...	14	...
November ...	...	...	...	...	9	...	...	...	...	...	9	...	1	...	...	...	3	...	...	...	...	...	12	...	...	...	...	...	12	...	...	...	2	...	10	...
December ...	...	...	...	...	4	...	...	...	...	...	4	...	...	...	...	...	2	...	...	...	...	...	23	...	...	...	...	...	23	...	...	...	...	...	11	...
Total ...	...	...	...	...	46	...	...	...	...	...	46	...	4	...	3	...	26	...	...	...	...	...	339	...	...	...	...	...	339	...	1	...	20	...	128	...
Admitted per 1,000 of Strength ...	...	...	...	...	403·26	...	...	...	...	...	403·26	...	35·09	...	26·29	...	227·81	...	...	...	...	...	819·38	...	...	...	...	...	819·38	...	1·53	...	30·64	...	196·11	...

1878.

H. M.'s 3rd (Queen's Own Regiment) Light Cavalry: Average Strength 128·24.

Months.	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.							
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January	...	...	...	...	5	...	...	...	...	...	5	...	...	...	1	...	5	...
February	...	...	...	...	1	...	...	...	...	...	1	...	...	...	...	...	7	...
March	...	...	...	...	4	...	...	...	...	...	4	...	...	...	...	...	8	...
April	...	...	...	...	3	...	...	...	...	...	3	...	1	...	...	...	3	...
May	...	...	...	...	2	...	...	...	...	...	2	...	...	...	1	...	4	...
June	...	...	...	...	5	...	...	...	...	...	5	...	...	...	...	...	8	...
July	...	...	...	...	4	...	...	...	2	...	2	...	...	...	...	...	8	...
August	...	...	...	...	14	...	...	...	1	...	1	...	...	...	...	...	4	...
September	...	...	...	...	53	...	...	...	1	...	...	...	...	...	...	...	4	...
October	...	...	...	...	53	...	...	...	1	...	...	...	...	...	...	...	2	...
November	...	...	...	...	9	...	...	...	2	...	3	...	...	...	...	...	5	...
December	...	...	...	...	11	...	...	...	...	...	...	...	...	...	...	...	5	...
Total	...	...	...	...	164	...	...	...	...	...	164	...	8	...	8	...	63	...
Admitted per 1,000 of Strength	...	...	...	...	1,278·85	...	...	...	...	...	1,278·85	...	62·38	...	62·38	...	491·34	...

H. M.'s 16th Regiment Native Infantry: Average Strength 679·32.

Months.	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.							
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January	...	...	...	...	9	...	...	...	...	...	9	...	...	...	...	...	15	...
February	...	...	...	...	12	...	...	...	...	...	12	...	...	...	2	...	9	...
March	...	...	...	...	13	...	...	...	...	...	13	...	...	...	1	...	28	...
April	...	...	...	...	23	...	...	...	...	...	22	...	...	...	4	...	16	...
May	...	...	...	...	37	...	...	...	...	...	37	...	...	...	3	...	21	...
June	...	...	...	...	47	...	...	...	...	...	47	...	...	...	5	...	28	...
July	...	...	...	...	57	...	...	...	...	...	57	...	1	...	3	...	28	...
August	...	...	...	...	67	...	...	...	...	...	67	...	6	...	1	...	19	...
September	...	...	...	...	489	...	...	...	4	...	493	...	2	...	...	...	20	...
October	...	...	...	...	317	...	...	...	...	...	317	...	1	...	...	...	13	...
November	...	...	...	...	204	...	...	...	...	...	204	...	9	...	3	...	15	...
December	...	...	...	...	137	...	...	...	...	...	137	...	6	...	2	...	22	...
Total	...	...	...	...	1,411	...	...	...	4	...	1,415	...	25	...	24	...	234	...
Admitted per 1,000 of Strength	...	...	...	...	2,074·84	...	...	...	5·88	...	2,080·2	...	36·77	...	34·62	...	344·20	...

1879.

Squadron 1st Bombay Lancers, Average Strength 120.

Months.	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.							
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January	...	...	...	...	5	...	...	...	1	...	5	...	...	...	...	...	4	...
February	...	...	...	...	6	...	...	...	...	...	7	...	1	...	...	...	5	...
March	...	...	...	...	7	...	...	...	1	...	8	...	...	...	...	...	2	...
April	...	...	...	...	5	...	...	...	...	...	5	...	...	...	...	...	3	...
May	...	...	...	...	2	...	...	...	...	...	2	...	...	...	1	...	1	...
June	...	...	...	...	2	...	...	...	...	...	2	...	...	...	2	...	4	...
July	...	...	...	...	6	...	...	...	...	...	6	...	...	...	1	...	7	...
August	...	...	...	...	8	...	...	...	...	...	8	...	...	...	...	...	2	...
September	...	...	...	...	31	...	...	...	...	...	31	...	...	...	1	...	1	...
October	...	...	...	...	50	...	...	...	...	...	50	...	1	...	...	...	2	...
November	...	...	...	...	31	...	...	...	...	...	31	...	...	...	1	...	1	...
December	...	...	...	...	18	...	...	...	...	...	18	...	...	...	...	...	1	...
Total	...	...	...	...	174	...	...	...	2	...	175	...	2	...	6	...	33	...
Admitted per 1,000 of Strength	...	...	...	...	1,458·0	...	...	...	16·6	...	1,441·8	...	16·6	...	50·0	...	291·6	...

2nd Grenadiers Bombay Native Infantry: Average Strength 604.

Months.	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.							
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January	...	...	...	...	18	3	...	...	...	...	18	3	3	...	1	...	12	...
February	...	...	...	...	14	1	...	...	1	...	15	1	...	...	...	...	11	...
March	...	...	...	...	7	...	...	...	...	...	7	...	...	...	...	...	11	...
April	...	...	...	...	5	...	...	...	...	...	5	...	1	...	1	...	7	...
May	...	...	...	...	10	...	...	...	...	...	10	...	...	...	...	...	5	...
June	...	...	...	...	4	...	...	...	...	...	4	...	...	...	1	...	6	...
July	...	...	...	...	20	...	...	...	1	...	21	...	...	...	1	...	1	...
August	...	...	...	...	36	...	...	...	...	...	36	...	...	...	1	...	3	...
September	...	...	...	...	291	...	...	...	...	...	291	...	1	...	1	...	4	...
October	...	...	...	...	411	...	...	...	1	...	412	...	1	...	1	...	7	...
November	...	...	...	...	333	1	...	...	...	...	333	1	...	...	2	...	3	...
December	...	...	...	...	119	1	...	...	...	...	119	1	1	...	2	...	4	1
Total	...	...	...	...	1,178	6	...	...	3	...	1,181	6	7	...	15	...	81	1
Admitted per 1,000 of Strength	...	...	...	...	1,950·33	...	...	...	4·91	...	1,955·2	...	11·58	...	25·0	...	134·10	...

1880.

Months.	Squadron 1st Bombay Lancers: Average Strength.																2nd Grenadiers (P. W. O.) Bombay Native Infantry: Average Strength 622.													
	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All other Causes.		Cholera.		Enteric Fever.		Malarial Fevers.						Dysentery.		Diarrhœa.		All other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.												Intermittent.		Remittent.		Continued.		Total Malarial Fevers.					
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January	No records.																		...	...	...	...	63	...	...	...	1	...	64	...	...	...	1	...	10	...
February																			...	...	...	...	21	...	...	...	...	...	21	...	...	...	3	...	7	1
March																			...	...	...	...	11	...	...	...	...	...	11	...	...	...	...	...	2	...
April																			...	...	...	...	22	1	...	...	...	...	22	1	...	...	1	...	...	...
May																			...	...	...	...	28	...	...	...	...	...	28	...	...	...	3	...	4	...
June																			...	...	...	...	22	...	...	...	...	...	22	...	...	...	2	...	7	...
July																			...	...	...	...	31	...	...	...	...	...	31	...	...	...	2	...	6	...
August																			...	...	...	...	59	...	...	...	—	...	59	...	...	...	9	...	4	...
September																			...	...	...	...	69	...	...	...	...	...	69	...	...	...	3	...	8	...
October																			...	...	...	...	69	...	...	...	...	...	69	...	...	...	1	...	6	...
November																			...	...	...	...	40	...	...	...	...	...	40	...	...	...	3	...	3	...
December																			...	...	...	...	29	...	...	...	...	...	29	...	...	...	...	...	7	...
Total																			...	...	...	...	464	1	...	...	1	...	465	1	...	...	28	...	64	1
Admitted per 1,000 of Strength																			...	...	...	...	736·6	...	...	...	1·5	...	739·3	...	...	...	45·5	...	101·7	...

1881.

Months.	Squadron 1st Bombay Lancers: Average Strength.																2nd Grenadiers (P. W. O.) Bombay Native Infantry: Average Strength 608.													
	Cholera.		Enteric Fever.		Malarial Fevers.								Dysentery.		Diarrhœa.		All other Causes.		Cholera.		Enteric Fever.		Malarial Fevers.						Dysentery.		Diarrhœa.		All other Causes.	
					Intermittent.		Remittent.		Continued.		Total Malarial Fevers.												Intermittent.		Remittent.		Continued.		Total Malarial Fevers.					
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
January	No record.																		...	...	...	...	12	...	...	...	1	...	13	...	...	...	...	...	9	1
February																			...	...	...	...	13	...	...	...	...	...	13	...	...	...	...	...	4	...
March																			...	...	...	...	21	...	...	...	4	...	25	...	...	...	1	...	7	...
April																			...	...	...	...	16	...	...	...	4	...	20	...	...	...	...	...	27	...
May																			...	...	...	...	9	...	...	...	...	...	9	...	...	...	1	...	8	...
June																			...	...	...	...	7	...	...	...	1	...	8	...	...	...	1	...	5	...
July																			...	...	...	...	7	...	...	...	...	...	7	...	...	...	1	...	5	1
August																			...	...	...	...	10	...	...	...	...	...	10	...	...	...	3	...	7	...
September																			...	...	...	...	56	...	...	...	2	...	58	...	...	...	6	...	11	1
October																			...	...	...	...	122	2	...	...	...	..	172	2	1	...	...	...	3	...
November																			...	...	...	...	51	1	...	...	3	...	54	1	5	...	...	...	7	...
December																			...	...	...	...	17	1	...	...	4	1	21	2	...	...	3	...	2	...
Total																			...	...	...	...	391	4	...	...	19	1	410	5	6	...	16	...	95	3
Admitted per 1,000 of Strength																			...	...	...	...	643·0	...	...	...	31·2	...	672·9	...	9·8	...	26·3	...	156·2	...

Nasirabad Water Analyses.

Number of Samples	Date.	Station.	Source.	Grains per Gallon. Total Solids.	Grains per Gallon. Chlorine.	Parts per Million. Free Ammonia.	Parts per Million. Albuminoid Ammonia.	Sediments, &c.	Quality.	Remarks.
	1882.									
1	9th November.	Nasirabad ..	Hr Lake water	21·7	6·3	·006	·26	Copious—vegetable debris, monads, paramœcia, entomostraca.	Bad.	The organic contamination in the Dunta Lake samples (sediments especially) is of vegetable origin only; the increase in the amount of chlorine being accounted for by the dissolution of the chlorides of sodium, calcium and magnesium from the surrounding rocks, which in this locality abound in the above-named salts.
2	Do. ..	Do. ..	Samples from Dunta Lake: Dunta Lake water.	20·	7·	·0132	·22	Copious—vegetable debris, monads, paramœcia, vorticella, entomostraca, rotifera.	Do.	
3	Do. ..	Do. ..	Kennedy's Pillar, Native Cavalry Lines, cutbrook.	19·	6·79	Nil.	·19	Copious—vegetable debris, monads, paramœcia, rotifera.	Do.	
4	Do. ..	Do. ..	No. 139 storage tank, E. I. Lines, west compartment, unfiltered.	19·	6·72	·005	·27	The same as above	Do.	
5	10th do.	Do. ..	Do. east compartment, filtered.	17·5	6·5	Nil.	·13	Very scanty—vegetable debris ..	Fair.	
6	Do. ..	Do. ..	Small storage tank, filtered	17·	6·2	Nil.	·14	Do. do.	Do.	
7	Do. ..	Do. ..	No. 1 Post Station Hospital hydrant, filtered.	17·	6·7	Nil.	·13	Do. do.	Do.	
8	Do. ..	Do. ..	No. 16 E. I. Quarter Company's Barrack iron tank, filtered.	17·	6·2	Nil.	·14	Do. do.	Do.	
9	11th do.	Do. ..	No. 4 stand-post near No. 5 Royal Artillery Hospital Barrack, filtered.	17·	6·23	·009	·21	Copious—vegetable debris	Bad.	
10	Do. ..	Do. ..	No. 4 Kennedy's Pillar, north hydrant, N. I. Lines, filtered	17·5	6·2	Nil.	·14	Scanty do.	Fair.	
11	Do. ..	Do. ..	No. 3 Kennedy's Pillar, north hydrant, Native Infantry Lines, unfiltered.	19·5	6·7	Nil.	·2	Copious—vegetable debris, monads, paramœcia, rotifera.	Bad.	
12	Do. ..	Do. ..	Executive Engineer's hydrant, unfiltered.	19·	6·9	·005	·19	Do. do.	Do.	
13	12th do.	Do. ..	Water from carbide filter cart filled direct from Dunta Lake.	17·	6·2	Nil.	·13	Scanty, vegetable debris	Fair.	
14	Do. ..	Do. ..	Water from carbide filter cart, filled direct from storage tank.	17·	6·	Nil.	·125	Do, do.	Do.	
15	Do. ..	Do. ..	Water from carbide filter cart filled from storage tank and passed through Mazoumara filter.	17·	6·	Nil.	·120	Do, do.	Do.	
16	14th do.	Do. ..	General Phayre's well water ..	70·	15·26	·005	·07	Vegetable debris, monads, paramœcia, crystals of mineral matter.	Bad.	
17	Do. ..	Do. ..	Do. from camel monsock.	70·9	15·26	·006	·11	The same as above	Do.	
18	Do. ..	Do. ..	Do. from bhisti's monsock.	70·9	15·26	·005	·13	Do. do. confervæ, rotifera.	Do.	
19	15th do.	Do. ..	Do. from filter tub in No. 22 B. L. Barrack.	70·9	15·26	·105	·16	Copious—vegetable debris, monads, paramœcia, confervæ, entomostraca, rotifera.	Do.	
20	Do. ..	Do. ..	Do. after passing through Mazoumara filter in the same barrack.	70·3	12·2	·005	·07	Crystals of mineral matter	Do.	
21	Do. ..	Do. ..	Dilwara well water	42·	6·37	·0131	·07	Vegetable debris, monads, paramœcia, confervæ.	Good.	
22	16th do.	Do. ..	Do. from mule cart ..	42·	6·37	·0260	·07	The same as above	Do.	
23	Do. ..	Do. ..	Do. from bhisti's monsock ..	42·	6·37	·024	·12	Copious—vegetable debris, oscillatoriæ, confervæ, monads, paramœcia, rotifera.	Bad.	
24	Do. ..	Do. ..	Do. from filter tub in No. 23 European Infantry Barrack.	42·	6·37	·026	·13	The same as above	Do.	
25	Do. ..	Do. ..	Do. after passing through Mazoumara filter in the same barrack.	42·	6·37	·006	·09	Nil	Good.	
26	17th do.	Do. ..	Tank near Dilwara well ..	10·	·35	·003	·23	Copious—vegetable debris, monads, paramœcia, rotifera.	Bad.	
27	Do. ..	Do. ..	Well in Native Infantry Hospital compound.	91·	26·6	·0131	·06	Vegetable debris, monads, paramœcia ..	Do.	
28	Do. ..	Do. ..	Well between this and Native Cavalry Lines (Hanuman's well).	137·4	47·33	·026	·11	Scanty—vegetable debris, monads, paramœcia.	Do.	
29	18th do.	Do. ..	Kuli's well near Kanjarpoora ..	99·3	24·5	·09	·11	Vegetable debris, monads, paramœcia, crystals of mineral matter.	Do.	
30	Do. ..	Do. ..	Diggee on the south-east of the Eidar Bastr.	18·	1·	·4	·26	Copious—vegetable debris, monads, paramœcia, rotifera, confervæ, oscillatoriæ, euglenæ, entomostraca.	Do.	
31	Do. ..	Do. ..	Diggee on the south-east of the Eidar Bastr.	17·5	1·19	·23	·23	Copious—vegetable debris, monads, paramœcia, euglenæ, entomostraca, rotifera, coloured cotton fibres.	Do.	
32	Do. ..	Do. ..	Bania's well (Savalia's)	89·4	17·3	·084	·12	Copious—vegetable debris, diatomaceæ, monads, paramœcia.	Do.	
33	19th do.	Do. ..	Doongra Bania's kheri	89·6	22·69	·095	·12	Vegetable debris, monads, paramœcia ..	Do.	
34	Do. ..	Do. ..	Chunnar's well (Tara Chunar) ..	138·6	34·3	Nil.	·13	Scanty—vegetable debris, monads, paramœcia, diatomaceæ, confervæ, crystals of mineral matter.	Do.	
35	Do. ..	Do. ..	Lohari Chunar's well	149·5	31·	·026	·09	Vegetable debris, monads, paramœcia, crystals of mineral matter.	Do.	
36	20th do.	Do. ..	Samples from prostitutes' houses: Water from the house of one Chunnali.	10·	1·	·20	·4	Copious—vegetable debris, monads, paramœcia, rotifera.	Do.	
37	Do. ..	Do. ..	Do. do. Ladari ..	143·	29·	·13	·20	The same as above	Do.	
38	Do. ..	Do. ..	Do. do. Pima ..	10·	1·05	·20	·26	Do. do.	Do.	
39	Do. ..	Do. ..	Do. do. Rampiee ..	10·5	2·	·09	·43	Do. do.	Do.	
40	Do. ..	Do. ..	Do. do. Rahimun ..	45·	9·55	·4	·26	Do. do.	Do.	
41	Do. ..	Do. ..	Do. do. Rumlee ..	20·	2·73	·0132	·19	Do. do.	Do.	
			Arsenal waters.							
42	Do. ..	Do. ..	Water mixed with carbonate of soda from the shop of Messrs. Pratap & Co.	209·	20·8	·05	·14	.....	Do.	
43	Do. ..	Do. ..	Soda water from the same shop.	..	..	·026	·18	.....	Do.	
44	22nd do.	Do. ..	Water mixed with carbonate of soda from Messrs. Pratap & Co.'s shop.	..	..	·05	·14	.....	Do.	
45	Do. ..	Do. ..	Soda water from do. ..	..	..	·03	·19	.....	Do.	
46	23rd do.	Do. ..	Sample of filtered water taken from the shop of one Karimbux, ginger-pop seller.	42·	6·73	·026	·16	Copious—vegetable debris, monads, paramœcia, rotifera.	Do.	
47	Do. ..	Do. ..	Do. from the shop of one Mahomed Khan (ginger-pop seller).	22·5	3·23	·05	·18	The same as above	Do.	
48	Do. ..	Do. ..	Do. from the shop of one Shaikh Cass (ginger-pop seller).	20·4	2·21	·03	·18	Do. do.	Do.	
49	24th do.	Ajmeer ..	Ananagar Lake	29·2	5·04	·05	·43	Copious—vegetable debris, monads, paramœcia, rotifera, confervæ.	Do.	
50	Do. ..	Do. ..	Doodla well	72·1	17·15	·08	·18	Copious—vegetable debris, confervæ, monads, paramœcia.	Do.	

T. G. HEWLETT,
Deputy Surgeon General.

SORABJI MANEKJI KAKA, L.M. & S.,
Assistant Surgeon,
Travelling Water Analyst.

No. 1504 OF 1882.

FROM

THE PRESIDENT OF THE CANTONMENT COMMITTEE,

NASIRABAD;

TO

DEPUTY SURGEON-GENERAL HEWLETT, C.I.E.,

LATE ACTING SANITARY COMMISSIONER FOR THE GOVERNMENT OF BOMBAY.

Dated Nasirabad, 18th December 1882.

SIR,

I have the honour to acknowledge the receipt of your letter, dated 30th November 1882, forwarding the report of your recent sanitary inspection of the Nasirabad Cantonment.

2. As neither paragraphs nor pages were numbered, I was obliged, for matters of reference, to number the pages in your report; this has, however, only been done in pencil to allow of erasures should you consider it necessary.

3. The report has been circulated to each member of the Committee and has been read by them with much interest. All important remarks on the existing sanitary arrangements within the scope of the Cantonment Committee and suggestions for their improvements were fully discussed at a special meeting when the resolutions now attached for your information were agreed upon.

I have the honour to be,

Sir,

Your most obedient Servant,

H. DAVIS, Colonel,

Commanding at Nasirabad, and President, Cantonment Committee.

PROCEEDINGS OF A SPECIAL CANTONMENT COMMITTEE MEETING HELD AT NASIRABAD ON FRIDAY, 15TH DECEMBER 1882, TO DISCUSS VARIOUS SUBJECTS IN CONNECTION WITH THE RECENT INSPECTION REPORT OF THE CANTONMENT OF NASIRABAD SUBMITTED BY DEPUTY SURGEON-GENERAL HEWLETT, C.I.E., WITH HIS LETTER DATED 30TH NOVEMBER 1882.

The report in question having been duly circulated for the information of the members of the Cantonment Committee, after full discussion of the subjoined remarks of Deputy Surgeon-General Hewlett, the following resolutions were arrived at:—

REMARKS BY INSPECTING OFFICER.	RESOLUTIONS OF COMMITTEE.
(1). *Page 60, Lock Hospital.*—That the registered prostitutes should be housed in one quarter of the Sadar Bázár, and that the Lock Hospital rules should be extended to all prostitutes within Cantonment limits.	Action in the matter is uncalled for. All the registered prostitutes have for the past eight months been housed in one quarter of the bázár. Lock Hospital rules have, by the orders of the Government of India (1880), been confined to the class of women associating only with European soldiers.
(2). *Pages 78 and 79, Dilwarra well.*—Recommendations for preserving the water from pollution.	That it is unnecessary to negotiate for the purchase of the adjoining field, but that the tree growing out of the well should at once be removed. Further, that a masonry covering and pumps for bringing the water to the surface are most desirable, and that the Local Government should be addressed on the subject with the view of ascertaining whether such an arrangement will be feasible. In the meanwhile the Executive Engineer to be called upon to submit a plan and estimate for carrying out the proposed alterations.

(3). *Pages 93 and 94.*—The impure character of drinking water in the houses of registered prostitutes and shops of pop vendors in the bázár.

It is quite impracticable for obvious reasons to supply sodawater from the regimental factory.

The Executive Engineer to be asked to place at the disposal of the Cantonment Committee a filter cart for the use of the registered prostitutes and pop vendors in the bázár, which should be filled with water conveyed from the Dilwarra well in a Commissariat water cart.

Brings to the notice of the Inspecting Officer that for some months under the orders of the Cantonment Committee pop vendors have been supplied with water direct from the Dilwarra well as also with three chattee filters which have, under the supervision of Surgeon-Major Chapman, been inspected from time to time.

(4). *Sadar Bázár, page 148.*—Recommendation that the monthly grant of Rs. 30 paid by the Cantonment Committee to the Mission Hospital should be raised to the extent of Rs. 50 monthly.

After fully discussing the present arrangements for medical treatment in the bázár it is agreed upon that a Civil Dispensary under the orders of a gazetted Civil Surgeon should be instituted in the Sadar Bázár. The Committee fully realize the valuable work done by Dr. Clark, the Superintendent of the Mission Hospital, but consider it more expedient that a Government Officer should supervise sanitary arrangements and medical care of the present large bázár. Should a Civil Dispensary not be introduced in the Sadar Bázár, the present monthly allowance will be increased to Rs. 50.

(5). *Page 170.—Recommendation* for the immediate introduction of properly filtered Danta water into the Sadar Bázár.

It has been for some time universally admitted that the introduction of good drinking water into the Sadar Bázár is an immediate necessity. This project in all its bearings has been most fully discussed by the Cantonment Committee during the present year, and is now before the Local Government for necessary preliminary arrangements.

(6). *Page 171.—Abolition of Latrines* at present in use and substitution of others on Colonel Goodfellow's design.

It is impossible to alter the existing latrine arrangement in the bázár. In the event of more being required, due attention will be given to Colonel Goodfellow's design.

(7). *Page 176.—The removal of cattle* from their present locality and the prohibition of manufacturing cowdung cakes within the bázár.

The recommendation will receive consideration.

(8). *Page 176.*—That stringent measures should be adopted to prevent cattle from being fed with litter from the Cavalry and Artillery.

Most stringent measures are in force, and offenders have been punished under Cantonment Regulations. Increased vigilance on the part of the police will be enforced, and the Commissariat Department asked, if possible, to arrange for the purchase of litter from the Royal Artillery and Cavalry Lines.

(9). *Page 177.*—Suggestion for improving ventilation of huts in the Bázár.

The suggestion will be adopted as opportunities may arise.

(10). *Page 177.*—Extension of metalled roads in the bázár.

The work will be carried on as far as funds may permit.

(11). *Page 177.*—Recommendation that the Conservancy of the Sadar Bázár should be under a European Inspector, and that all sweepers should be public servants.

Arrangements will be made for European supervision; as all the sweepers in the Sadar Bázár are under Cantonment rules and liable to punishment, it is not considered necessary to make any change in their service.

(True Copy)

J. H. NEWILL, Captain,
Secretary, Cantonment Committee,
Nasirabad.

No. $\frac{15-5}{83}$.

FROM

DEPUTY SURGEON GENERAL T. G. HEWLETT, C.I.E.,
Late Acting Sanitary Commissioner;

TO

COLONEL POTTINGER, ROYAL ARTILLERY,
Secretary to Government, Military Department.

15*th February* 1883.

SIR,

In obedience to the instructions conveyed in paragraph 15 of Government Resolution, General Department, No. 2617, dated 23rd August 1876, I have the honour to submit, for the information of His Excellency the Governor in Council, the accompanying Report on the sanitary condition of the Cantonment of Nasirabad, with a copy of the Resolution adopted by the Cantonment Committee on the proposals I made.

I regret to learn that, by orders of the Government of India, the Lock Hospital rules have been confined to those women who associate only with British soldiers. Such a measure, I respectfully submit, utterly frustrates the effective working of the Act, and I think it would be better to abolish the Act, and save the expenditure, than to trust to such a half measure. Most of the venereal disease in Nasirabad, as in other stations, is contracted from women not on the register, but who could easily be brought on if the rules were allowed to be applied to all prostitutes carrying on their trade within specified limits.

With reference to the decision of the Committee on the proposals I made regarding the Dilwarra well, I am still of opinion, as stated in the report, that the portion of the field immediately along side the well should be *rented* if it cannot be bought and allowed to lie fallow. It is now heavily manured; and as the well is at present the only source of supply of pure water for the troops, I recommend most strongly this precautionary measure being adopted.

The analyses prove that the beverages sold by the vendors in the bázár as soda water and ginger pop are impure, and I think the use of Macnamara filters should be insisted on. No sort of confidence can be placed in the three ghurras, as the sand and charcoal are practically never changed. These Macnamara filters should be under the charge of the European Serjeant, who should see them cleaned once every three months. The men themselves complained to me of the evil effects of the ginger pop, and I am sure it is not a safe beverage for them to drink.

I have the honour to be,

Sir,

Your most obedient Servant,

T. G. HEWLETT,
Deputy Surgeon General.

DISTRICT & CANTONMENT OF NEEMUCH

Executive Engineer
Neemuch Division

REPORT ON THE CANTONMENT OF NEEMUCH.

The Cantonment of Neemuch—situated on the confines of the territories under the jurisdiction of the Central India Agency, in longitude 74° 53′ and latitude 24° 28′ 30″ north, at a height above mean sea level varying from 1,634 feet at the north end of camp to 1,543 on the south—is reached by the Rajputána-Málwa Railway at a distance of 595 miles from Bombay, being 169 miles distant by rail from the Military Cantonment of Mhow on the south and 135 miles from Nasirabad on the north, and with the exception of 2 small villages —Bholiawass and Jeysingpura—which are the property, respectively, of Udepur and Tonk, the surrounding country belongs to Gwalior. I am indebted to Mr. Gael, the Executive Engineer, for the following topographical description :—

"The Cantonment of Neemuch occupies an extensive ridge whose axis runs for about 3 miles in a direction north-west and south-east. On a cross section, at right angles to this ridge (that is, south-west and north-east), there is a considerable fall from the centre towards two streams, the Parade Nála and the Leora Nála, which traverse the camp in a direction parallel to the axis and at a distance of about a mile apart. There is also a well-marked fall on the main ridge from north-west to south-east.

"The new barracks for British troops are located at the highest or north-west end, in a line fronting the south-west. The Sadar Bázár is at the lower or south-east angle of Cantonment, the Native Infantry and the Native Cavalry lines being situated centrally, with a north-east aspect overlooking the Parade Ground and Parade Nála.

"Rising from the Leora Nála on the south-west boundary of the camp, a broad plateau, known as the Jeerun Maidán, extends uninterruptedly for about 4 miles. This plateau is cultivated in desultory patches here and there. It terminates in an abrupt descent or depression to cultivated plains below. This depression is a well-marked feature, extending in an unbroken circuit from south-west to north, and at a distance varying from 2 to 5 miles from the Cantonment boundary.

"From west to north undulating and cultivated downs extend for several miles. Here are situated the villages of Dunglowda, Chungeria, Beroda, Leora and Daneria on elevated knolls within a 2 miles radius from the limits of Cantonment. To the north-east and east similar undulations and villages are met with, which extend across the drainage lines of the Ganceri and its tributaries towards the foot of the Ruttunghur Range, the nearest point of which is 12 miles due north of Cantonment.

"The prevailing soil is the red laterite; the plateau of the new barracks, about half a square mile, is on this formation, which also extends along the crest of the main axial ridge of Cantonment, giving place on the descent towards the low ground of the nálás on either side to the grey moorum (overlying the trap) or the black cotton soil. In these last-named positions the trap rock is usually met with at a depth varying from 10 to 40 feet below the surface.

"The Jeerun Maidán to the south-west, outside Cantonment, is red soil, with occasional patches of mixed soil where it is under cultivation. To the west and north-west the cultivation is more or less on the cotton soil, with an out-crop of laterite here and there, which to the north is wholly black soil, which commences within the Cantonment itself and extends for some miles along a subsidiary watershed line at a comparatively high level. Without the north-east and east limits of Cantonment the red soil crops up again, to the south-east and east the black cotton soil under cultivation is principally met with, and again on the south.

"The plateau of the barracks is well situated for surface drainage, there being a good fall on all sides, except on the north. The subsidiary watershed above noted running for some distance without appreciable fall, surface water does not escape readily. During and after heavy rain it may be seen stagnant in puddles and surface inequalities at about 3 feet below the level of the ground. The sub-soil as distinguished from the surface water level was found to be in the wells immediately contiguous to the hospital (the most northerly of the barracks) about 6 feet below ground in October. A trial pit, 925 feet north of the hospital, sunk in black soil and yellow moorum reached sub-soil water at 9 feet in October 1882."

The above description is most valuable, as it shows that for many miles outside Cantonment from the south-west to north of the European barracks there is an area of depression which during and after the rains is very nearly waterlogged and marshy. The black cotton soil, of which it for the most part consists,

is especially retentive of moisture; and, as will be seen further on, the prevailing breeze during and after the rains passes over this ground, and its full force is felt in the barracks. It also shows that the ground to the north of camp consists wholly of black cotton soil, which forms a subsidiary watershed at a higher level than the plateau on which the barracks stand. The accompanying plan, which has been prepared at my request by Mr. Gael, of the Cantonment and surrounding country gives a longitudinal section of profile of ground on a line from north to south for a distance of 6 miles, and shows very clearly the commencement of the area of depression which, it will be remembered, is continued from north to south-west. It also shows that there is a continuous descent from the high land on the north of the station down to the lowest part at the Sadar Bázár. The Cantonment, being well-wooded, presents a parklike appearance, but this growth of trees is an evidence of there being a great deal of moisture in the sub-soil.

Climate.

The climate of Neemuch is not characterised by any great extremes. It is not as cold during the winter as at Nasirabad, nor as hot in summer, but it is both colder and hotter than Mhow. The winter usually sets in about November, and lasts until the beginning of March, the climate being cold and bracing. The hot season from April to June is described as being very trying during the day; but the nights are generally cool, and compare very favourably with the sultry oppressive heat felt in many stations of the Bengal Presidency.

The following returns, obtained from the observer at this station, for the years 1878-79-80-81 and part of 82, afford full details of the meteorological conditions:—

STATEMENT

Station, Neemuch.

	Height of Barometer Cistern above Mean Sea Level	Barometric Pressure. Mean of 10 hours and 16 hours.	Mean at 10 hours.	Mean at 16 hours.	Mean Range.	Radiation. Solar. Mean Maximum.	Mean Degrees above Maximum in shade.	Highest Reading.	Date of occurrence.	Nocturnal. Mean Minimum.	Mean Degrees below Minimum in shade.	Lowest Reading.	Date of occurrence.	Temperature of Air. Mean Maximum.	Mean Range.	Mean Minimum.	Mean of Minimum 10 hours and 16 hours.	Mean at 10 hours.	Mean at 16 hours.	Highest Reading.	Date of occurrence.	Absolute Range.	Lowest Reading.	Date of occurrence.	Sea Level Values of Barometric Pressure Mean of 10 hours and 16 hours.	Mean of 24 hours.	Temperature of Air. Mean of 10 hours and 16 hours.
January 1879	1439·56	29·362	29·423	29·301	·122	124·8	59·5	134·4	8th	35·2	10·1	24·5	2nd	74·4	29·0	45·3	59·9	61·9	77·5	86·9	25th	43·9	39·6	6th	29·484	
February	1439·56	29·345	29·404	29·286	·118	130·9	44·5	136·4	19th	45·9	9·1	39·2	26th	85·7	31·7	53·9	69·4	71·8	87·4	94·7	23rd	54·7	46·9	28th	29·465	
March	1439·56	29·218	29·278	29·158	·120	139·8	52·2	146·4	18th	50·2	10·9	40·1	2nd	93·6	32·4	61·2	77·4	79·8	95·7	102·5	29th	61·2	54·1	28th	29·338	
April	1439·56	29·162	·220	29·107	·113	143·0	63·6	152·5	19th	61·6	9·2	49·6	15th	99·3	29·4	69·9	85·0	87·6	102·6	110·4	30th	67·9	60·6	15th	29·281	
May	1439·56	·065	·117	·008	·109	140·9	59·5	154·7	14th	69·7	9·6	60·2	13th	102·6	32·7	69·9	85·9	90·3	100·1	107·4	14th	59·4	49·0	1st	29·174	
June	1439·56	..	..	..	..	..	..	..	..	72·6	5·5	67·1	4th	97·5	25·0	72·5	84·9	87·1	98·0	110·1	16th	43·1	67·9	21st	..	
July	1439·56	..	..	..	..	..	..	..	..	75·5	1·9	69·2	8th	89·5	14·3	75·1	83·5	85·7	89·6	103·2	1st	32·1	69·6	8th	29·174	
August	1439·56	27·998	29·044	27·952	·092	..	..	..	..	72·3	1·9	70·1	19th & 31st	85·6	11·3	74·3	79·1	80·5	81·9	90·6	3rd	17·4	73·2	19th	29·037	
September	1439·56	29·049	·102	·997	·105	..	..	..	..	69·6	2·7	62·1	20th	83·5	13·6	73·9	80·3	82·9	83·3	91·4	29th	25·7	69·1	20th	29·086	
October	1439·56	·138	·200	29·146	·054	130·9	50·5	164·9	29th	..	..	..	..	89·3	33·8	58·1	73·7	76·1	87·1	99·4	4th	41·6	54·8	30th	29·141	
November	1439·56	·276	·336	·222	·107	147·1	61·9	161·7	4th	..	..	..	..	85·5	30·1	55·5	71·7	76·6	83·4	93·7	4th	42·8	47·2	17th	29·264	
December	1439·56	·228	·285	·171	·100	145·5	65·3	145·9	1st	37·6	14·5	21·9	23rd	75·9	28·6	47·3	62·9	66·4	74·9	84·1	1st	44·6	39·5	24th	29·038	
January 1879	1439·56	29·350	29·408	29·293	·115	141·6	60·1	149·7	4th	32·2	10·5	24·9	19th	78·6	30·4	48·1	64·2	67·4	77·1	84·5	30th	42·6	41·9	17th	29·057	
February	Do.	·286	·344	·226	·118	149·1	60·4	157·2	14th	36·0	10·8	25·2	27th	80·7	30·5	50·2	67·5	69·9	79·9	88·6	4th	42·6	46·2	11th	29·079	
March	Do.	·244	·309	·180	·117	149·1	61·5	162·7	26th	40·0	12·0	29·0	1st	89·2	29·7	59·5	74·9	76·9	86·7	99·4	29th	51·5	46·9	5th	29·074	
April	Do.	·162	·220	·107	·113	146·2	63·2	156·6	7th	46·3	11·6	36·0	2nd & 17th	90·3	31·6	58·7	74·5	76·8	88·1	97·4	7th	48·2	49·2	2nd	29·000	
May	Do.	·056	·050	27·955	·126	144·4	59·9	174·7	25th	..	..	..	..	106·4	38·7	67·7	80·6	86·5	102·9	112·7	30th	69·1	77·6	8th	29·003	
June	Do.	27·921	27·998	·903	·095	139·1	59·3	147·9	10th	..	..	..	..	95·9	19·6	76·3	85·5	87·5	93·5	102·8	13th	35·5	67·6	7th	29·047	
July	Do.	·040	·087	·018	·077	147·6	59·8	156·9	20th	80·3	15·0	74·2	6th	87·3	9·4	77·9	86·9	88·9	91·2	100·8	24th	29·3	70·6	20th	29·158	
August	Do.	·021	·066	·000	·066	146·2	59·1	156·2	2nd	69·6	2·3	66·5	22nd	84·9	10·6	74·3	83·6	85·4	87·5	96·8	3rd	25·7	70·6	20th	29·138	
September	Do.	28·987	29·133	28·945	·091	136·0	64·6	158·4	19th	65·8	4·5	47·7	24th	85·5	13·2	72·3	80·1	82·2	82·6	92·6	20th	37·7	64·9	24th	29·035	
October	Do.	·240	·294	·187	·107	150·9	62·4	160·7	30th	62·9	11·5	49·9	31st	88·4	34·1	54·3	71·8	75·4	86·7	91·5	2nd & 3rd	34·7	56·8	30th	29·196	
November	Do.	·318	·392	·244	·148	149·4	67·2	160·7	11th	54·1	10·6	39·5	27th	80·2	29·7	50·5	67·3	72·7	78·4	86·4	6th	40·2	46·2	28th	29·324	
December	Do.	·337	·397	·277	·120	139·7	62·2	149·5	3rd	51·6	14·8	21·5	22nd	75·5	29·8	46·7	61·9	65·5	73·9	80·9	4th	40·1	40·8	14th	29·166	
January 1880	Do.	·224	·284	·165	·119	141·7	61·5	146·2	16th	33·6	10·4	23·5	24th	80·9	31·1	49·8	65·6	67·9	78·8	87·9	8th	46·8	41·9	24th	29·005	
February	Do.	·264	·324	·244	·118	140·7	62·7	147·0	24th	34·6	14·2	19·5	18th	76·6	26·1	49·8	63·5	66·4	74·4	87·1	24th	45·7	41·4	17th	29·066	
March	Do.	·156	·193	·148	·124	137·1	59·8	142·7	31st	41·1	16·5	25·2	1st	81·2	30·9	50·3	65·6	67·1	79·4	90·1	29th	49·1	37·4	1st	29·024	
April	Do.	·134	·192	·076	·116	140·2	63·2	150·1	29th	47·1	16·2	30·9	1st	87·3	31·2	56·1	71·5	73·9	85·3	94·5	29th	49·8	45·7	1st	29·104	
May	Do.	·054	·095	27·998	·097	139·0	62·9	167·1	17th	49·6	8·6	40·3	1st	102·1	34·9	67·2	80·7	85·0	101·4	109·1	22nd	50·6	51·4	29th	29·042	
June	Do.	27·926	27·978	·874	·104	137·6	59·6	146·2	2nd	57·6	6·0	51·5	27th	97·6	32·7	64·9	81·2	83·6	96·3	104·2	2nd	39·7	64·5	27th	29·000	
July	Do.	·040	·087	·000	·087	145·4	60·3	157·7	8th & 12th	69·2	10·7	59·7	26th & 29th	86·1	12·5	73·6	79·7	82·9	86·6	94·5	5th	18·7	72·5	10th	29·184	
August	Do.	28·032	28·074	·001	·073	150·0	60·0	161·7	4th	59·5	12·6	42·7	31st	84·6	14·5	70·1	77·3	79·7	83·3	91·4	30th	27·9	67·1	29th	29·477	
September	Do.	·104	·150	28·052	·098	143·9	63·1	161·7	20th	56·6	12·9	40·9	23rd	86·5	16·6	69·9	77·5	80·2	83·8	93·5	23rd	29·4	63·1	22nd	29·710	
October	Do.	·022	·057	·000	·057	151·6	61·9	159·7	30th	44·1	11·1	35·7	29th	87·1	31·6	55·5	70·1	72·8	86·2	94·6	4th	40·5	46·6	16th	29·508	
November	Do.	·262	·316	·208	·108	150·7	64·8	161·7	1st	52·1	14·6	37·5	30th	82·1	31·6	50·5	66·3	69·1	80·1	89·6	1st	41·6	47·6	16th	29·397	
December	Do.	·360	·444	·325	·119	142·8	64·2	147·9	31st	35·6	12·5	21·6	26th	78·1	29·5	48·6	64·8	68·6	76·91	85·1	26th	45·6	37·5	16th	29·097	
January 1881	Do.	·295	·359	·232	·127	141·9	62·4	149·7	17th	..	..	..	..	79·6	29·7	49·9	64·1	66·9	77·3	85·6	17th	42·9	36·7	7th	30·100	
February	Do.	·248	·314	·182	·132	142·1	63·2	150·1	28th	..	..	..	..	82·6	30·7	51·9	67·3	69·9	80·1	88·6	28th	43·9	38·7	7th	30·077	
March	Do.	·196	·258	·135	·123	145·6	63·0	160·7	30th	47·2	11·4	31·6	8th	89·6	30·1	59·5	74·7	76·8	87·5	96·3	24th	52·6	45·0	30th	29·934	
April	Do.	·102	·161	·043	·118	144·2	63·2	157·2	13th	49·2	10·2	39·0	13th	91·6	31·8	59·8	75·7	77·9	89·1	97·4	13th	49·8	47·6	30th	29·881	
May	Do.	·033	·077	27·994	·111	139·3	62·9	174·7	8th	..	..	..	..	106·1	39·5	66·6	80·9	86·1	102·3	110·8	11th	69·8	67·5	8th	29·653	
June	Do.	27·956	·005	·918	·087	138·7	57·8	160·9	6th	..	..	..	..	99·4	31·6	67·8	80·7	83·0	104·6	108·1	6th	34·7	69·9	30th	29·810	
July	Do.	·012	27·971	·053	·118	140·0	59·3	151·9	2nd	..	..	..	..	97·6	30·2	67·4	80·1	82·6	96·3	104·2	2nd	37·5	66·7	30th	29·737	
August	Do.	·075	28·022	·018	·104	140·9	62·6	160·7	11th	..	..	..	..	93·9	31·1	62·8	77·8	79·6	82·1	90·9	2nd	10·4	79·5	2nd	29·800	
September	Do.	28·000	·130	28·052	·078	132·4	60·6	162·6	28th	..	..	..	..	86·6	15·9	70·7	78·6	80·8	84·2	93·6	28th & 29th	29·4	63·6	28th	29·715	
October	Do.	·029	·085	·976	·109	132·6	64·6	160·7	4th	..	..	..	..	89·4	33·1	56·3	72·9	74·8	86·7	95·7	10th	34·2	59·6	31st	29·660	
November	Do.	·228	·282	·174	·108	134·5	64·6	160·7	4th	..	..	..	..	86·4	33·1	53·3	69·2	71·6	83·1	92·6	4th	39·8	53·3	30th	29·520	
December	Do.	·374	·430	·314	·116	142·9	64·9	150·4	18th	..	..	..	..	79·2	29·9	49·3	64·6	67·9	77·9	84·8	23rd	38·9	43·8	18th	30·078	
January 1882	1439·56	29·378	29·430	29·326	·104	144·4	64·6	153·1	31st	37·6	12·9	28·0	13th	79·5	29·6	49·9	65·2	67·5	78·2	85·1	28th	40·1	41·4	13th	30·062	
February	Do.	·301	·354	·247	·107	141·7	63·7	151·6	24th	36·6	13·6	23·0	1st	82·6	30·1	52·5	68·4	70·7	81·2	89·6	24th	43·6	38·0	1st	29·997	
March	Do.	·261	·324	·201	·123	144·6	63·9	161·6	31st	40·1	14·4	26·2	1st	85·6	31·0	54·6	70·8	72·9	85·1	93·5	30th	49·0	36·5	1st	29·954	
April	Do.	·181	·242	·121	·121	141·2	63·2	160·9	8th	34·2	15·6	47·4	22nd	100·6	37·9	62·7	80·4	83·4	100·1	110·1	8th	63·0	47·1	30th	29·754	
May	Do.	·091	·151	·031	·120	140·0	63·2	174·7	3rd	..	..	..	..	104·6	39·6	65·0	80·3	85·1	102·6	111·6	3rd	69·8	65·8	30th	29·653	
June	Do.	27·917	27·966	27·868	·098	137·6	61·4	179·5	16th	..	..	..	..	99·0	32·9	66·1	80·4	84·1	97·1	107·6	16th	39·0	68·5	30th	29·600	
July	Do.	·000	·050	·951	·099	141·7	64·6	167·1	2nd	71·6	11·5	59·7	30th	83·2	10·3	72·9	77·2	78·5	80·2	91·1	2nd	23·1	70·8	30th	29·917	
August	Do.	28·018	28·066	·971	·095	140·0	63·4	157·6	10th & 12th	64·8	12·7	51·1	31st	84·9	12·1	72·8	78·1	79·7	82·1	91·1	10th	28·4	62·7	31st	29·807	
September	Do.	·004	·140	28·046	·093	139·4	62·1	160·6	24th	69·6	13·2	52·4	30th	87·9	17·5	70·2	78·7	81·2	84·9	90·9	23rd & 24th & 25th & 26th & 30th	29·4	66·7	19th	29·738	

Stations, Neemuch.	Vapour Tension.		Humidity.		Rainfall.		Number of Observations of Wind from each Direction at 10 and 16 hours.																Calms.	Variable.	Prevalence and Direction of prevailing Wind.	Hourly Velocity of Wind regardless of Direction.	Mechanical Components of Wind in Miles per Hour.	
	Mean at 10 hours.	Mean at 16 hours.	Mean at 10 hours.	Mean at 16 hours.	Mean at 10 hours and 16 hours.	Total during month.	Number of rainy days.	N.	N.N.E.	N.E.	E.N.E.	E.	E.S.E.	S.E.	S.S.E.	S.	S.S.W.	S.W.	W.S.W.	W.	W.N.W.	N.W.	N.N.W.			At 10 hours.	At 16 hours.
																										N.	E.	N.	E.
January 1878.	427	471	13	25	4·96	0·24	1	2	6	4	11	3	6	3	2	2	2	2	2	2	1	3	...	...	26N. 69E.	...	...	...	...
February ,,	516	547	14	27	5·12	0·03	1	1	2	1	2	1	3	6	2	2	2	2	2	2	2	2	...	...	26N. 72E.	...	...	...	...
March ,,	574	575	17	27	5·12	0·00	...	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	...	...	26N. 69W.	...	...	...	...
April ,,	525	513	25	17	2·72	0·00	...	...	...	...	...	...	1	1	1	2	6	7	15	3	2	2	...	...	26S. 68W.	...	...	...	...
May ,,	573	606	25	24	3·72	0·00	...	...	...	...	...	...	...	...	...	1	1	4	16	5	3	1	...	...	26S. 74W.	...	...	...	...
June ,,	641	662	30	33	6·92	1·66	4	...	2	...	...	...	...	...	...	1	2	21	16	11	4	2	...	...	26S. 67W.	...	...	...	...
July ,,	709	717	37	37	9·36	2·92	6	...	...	...	...	...	...	...	...	...	1	14	25	6	1	4	...	...	26S. 69W.	...	...	...	...
August ,,	685	685	41	43	9·60	1·53	17	...	1	...	1	...	...	...	...	...	4	31	30	1	...	...	...	...	26S. 68W.	...	...	...	...
September ,,	730	773	59	64	6·96	10·78	12	8	4	2	2	2	1	1	1	2	4	11	6	7	3	2	...	...	42N. 89W.	...	...	...	...
October ,,	487	480	27	21	1·32	0·00	...	4	3	1	3	2	1	1	1	2	2	2	2	2	4	3	...	...	41N. 49W.	...	...	...	...
November ,,	330	328	20	12	0·96	0·00	...	6	6	4	2	1	1	1	1	1	1	1	1	1	1	2	...	...	34N. 54E.	...	...	...	...
December ,,	396	396	24	18	0·24	0·00	...	4	4	4	2	2	3	4	6	1	2	2	1	2	2	2	...	...	32N. 80E.	...	...	...	...
January 1879.	371	395	25	19	1·18	0·00	1	1	2	2	7	3	3	3	3	1	4	3	3	4	3	4	...	...	13S. 39W.	...	...	...	...
February ,,	436	440	28	23	2·28	1·20	2	1	...	...	1	1	3	2	4	3	2	1	2	3	4	4	...	...	26S. 59W.	...	...	...	...
March ,,	532	508	33	19	1·26	0·00	...	1	...	1	2	1	2	6	...	2	1	2	7	7	16	4	2	...	40S. 81W.	10·00	—0·08	—4·95	—1·61	—9·71
April ,,	581	595	37	17	1·72	0·00	...	2	...	...	1	2	...	1	1	1	1	1	11	6	14	11	6	2	46S. 90W.	12·03	—0·09	—6·28	—2·71	—13·78
May ,,	532	499	31	18	2·60	0·00	...	3	1	...	...	1	...	...	...	...	...	1	7	16	20	11	2	1	43S. 83W.	13·24	—0·01	—14·28	—3·60	—19·89
June ,,	631	646	35	34	7·56	4·05	16	1	...	...	...	...	...	...	...	...	...	1	15	18	5	3	1	...	39S. 85W.	10·00	—0·07	—14·72	—3·96	—20·74
July ,,	700	709	55	50	9·92	9·05	21	...	...	...	...	...	...	...	...	...	...	...	27	22	5	2	1	...	36S. 85W.	11·49	—0·08	—16·92	—4·56	—24·98
August ,,	734	729	60	54	9·92	6·70	20	...	...	...	...	...	...	...	...	...	...	...	25	25	5	1	...	...	35S. 85W.	10·58	—0·07	—15·57	—4·20	—22·87
September ,,	704	709	69	64	9·68	4·93	19	2	2	2	1	1	1	1	...	...	...	...	9	12	11	4	3	13	30N. 97W.	12·63	+0·05	—11·58	+1·83	—9·89
October ,,	531	455	58	34	5·23	0·47	3	1	1	2	1	1	1	1	1	1	1	10	4	6	9	9	1	...	34N. 68W.	7·96	+0·25	—4·23	+0·66	—3·61
November ,,	377	356	71	39	6·48	0·00	...	4	4	6	5	2	3	6	7	4	6	1	...	...	3	8	1	...	29S. 78E.	5·75	—0·23	+2·84	+0·66	+3·27
December ,,	384	386	59	28	6·96	0·00	...	1	2	4	3	4	6	1	8	13	4	7	1	...	...	3	3	...	27S. 24E.	6·07	—0·25	+1·68	—1·20	+0·23
January 1880.	390	476	17	18	1·80	0·00	...	2	2	6	3	2	2	2	6	7	3	13	6	3	4	1	1	...	26S. 21W.	8·94	—0·09	+0·75	—1·20	—0·74
February ,,	470	475	20	19	2·42	0·00	...	1	3	3	...	2	2	2	1	2	2	18	4	1	4	2	1	...	26S. 16W.	8·13	—0·05	—0·75	—0·94	—4·09
March ,,	526	516	17	17	4·16	0·00	...	1	1	1	1	1	1	1	1	1	2	10	10	13	4	2	1	...	27S. 37W.	11·07	—0·07	—6·97	—2·32	—13·62
April ,,	540	540	15	12	1·76	0·00	...	...	...	...	...	...	...	...	...	...	2	12	15	16	8	6	...	...	26S. 37W.	14·00	—0·09	—10·60	—3·07	—17·22
May ,,	476	487	21	17	2·72	0·00	...	...	...	...	...	...	...	...	...	...	1	11	13	4	6	3	2	...	31S. 62W.	12·16	—0·12	—12·70	—3·94	—19·66
June ,,	616	598	46	37	4·92	4·90	4	1	...	...	...	...	...	...	...	...	...	4	5	4	1	2	1	...	29S. 57W.	10·10	—0·06	—10·70	—3·71	—18·82
July ,,	789	776	79	69	9·25	13·69	15	1	1	...	...	...	...	...	1	...	...	37	5	4	7	5	1	...	26S. 66W.	10·22	—0·07	—11·22	—3·78	—18·54
August ,,	717	717	73	64	9·68	8·18	17	...	...	...	...	...	...	...	...	...	...	44	7	4	3	3	1	...	26S. 58W.	17·21	—0·09	—13·26	—3·29	—19·84
September ,,	730	678	76	60	9·68	9·01	11	1	1	2	1	2	1	2	1	1	1	27	5	2	3	3	1	...	41S. 74W.	11·41	+0·01	—8·78	—2·83	—14·60
October ,,	543	449	59	31	3·24	0·26	3	1	1	2	2	1	2	2	2	2	2	9	1	1	4	12	12	3	41S. 75W.	8·66	+0·21	—3·15	+2·69	—3·26
November ,,	360	356	51	37	6·00	0·00	...	3	2	1	1	1	1	1	2	2	2	5	2	1	1	3	4	2	28S. 7E.	7·45	—0·04	+0·98	—1·23	—0·17
December ,,	399	395	57	28	4·70	0·05	1	2	2	1	1	1	4	4	3	14	7	9	1	2	3	4	6	...	26S. 47E.	9·73	—0·05	+2·61	+0·91	+3·49
January 1881.	541	595	39	34	5·20	0·00	...	2	1	1	2	3	1	3	6	6	3	9	4	3	4	3	2	...	29S. 29W.	8·67	—0·01	+2·60	+0·77	—1·17
February ,,	561	594	34	28	4·64	0·00	...	2	1	1	1	1	2	2	4	2	2	21	7	2	3	2	2	...	25S. 60W.	8·84	—0·04	+3·02	+0·76	—1·70
March ,,	561	594	34	28	5·21	0·16	2	...	...	1	1	1	2	4	5	21	7	5	2	2	2	2	1	...	28S. 70W.	9·41	—0·04	+3·02	+0·76	—1·70
April ,,	518	525	28	19	2·40	0·00	...	...	...	...	...	...	...	...	...	1	1	17	16	10	9	4	1	...	29S. 70W.	9·41	+0·11	+2·83	+0·72	—1·58
May ,,	540	577	31	24	3·12	0·00	...	...	...	...	...	...	...	...	...	...	...	11	20	10	9	6	1	...	29S. 66W.	10·40	+0·09	+2·29	+0·58	—1·29
June ,,	606	634	41	40	4·28	0·21	...	...	...	...	...	...	...	...	...	...	...	2	21	24	2	1	...	...	29S. 56W.	17·13	+0·06	+0·21	+0·05	+0·39
July ,,	671	687	51	47	6·92	1·57	7	...	...	...	...	...	...	...	...	...	...	1	25	5	1	...	...	...	29S. 61W.	14·03	—0·02	—11·00	—2·81	—16·83
August ,,	709	703	66	74	9·96	10·64	15	2	...	...	...	...	...	...	...	...	...	1	16	4	1	...	...	...	27S. 57W.	9·37	—0·11	—8·97	—2·67	—12·39
September ,,	697	707	67	61	9·27	2·93	8	1	...	...	1	...	...	...	...	...	...	26	8	2	4	6	2	...	29S. 65W.	9·80	—0·02	—11·00	—2·81	—15·69
October ,,	490	479	76	34	7·44	1·31	7	...	...	1	1	...	...	...	...	...	...	2	2	1	11	13	3	1	24S. 72W.	9·11	—0·05	+2·99	+0·79	—1·27
November ,,	395	373	74	39	6·96	0·00	...	2	1	2	1	1	1	1	1	1	1	1	1	1	1	2	1	...	27S. 47W.	10·27	—0·04	+3·02	+0·76	—1·58
December ,,	399	416	69	39	5·96	0·00	...	2	1	4	2	2	3	8	3	2	1	1	1	1	1	1	1	...	26S. 32E.	8·99	—0·07	+3·02	+0·76	—1·58
January 1882.	542	566	37	28	5·36	0·14	1	...	...	2	2	6	6	4	3	4	2	11	7	3	3	1	1	...	29S. 29W.	9·24	—0·10	+3·06	—0·67	—4·31
February ,,	521	545	28	23	3·92	0·14	1	...	...	1	1	2	3	3	2	3	2	11	7	5	3	3	1	...	28S. 34W.	11·79	—0·16	+4·16	—1·03	—6·65
March ,,	572	606	34	31	6·00	...	...	...	...	...	...	...	...	...	...	...	...	5	5	3	5	14	3	...	44S. 80W.	11·76	+0·18	—1·79	+0·46	—0·93
April ,,	578	599	14	13	2·00	0·00	...	...	...	...	...	...	...	...	...	...	...	2	9	3	11	12	9	1	31S. 61W.	13·18	+0·13	—2·78	+0·71	—1·30
May ,,	599	616	19	17	2·72	1·96	3	...	...	...	...	...	...	...	...	...	...	1	19	14	3	7	3	1	30S. 81W.	15·24	+0·20	—3·95	+1·01	—2·05
June ,,	678	668	46	40	5·68	3·00	5	...	...	...	...	...	...	...	...	...	...	1	13	12	22	1	...	...	29S. 77W.	22·20	—0·08	—12·95	—3·30	—18·71
July ,,	703	675	68	60	9·68	11·16	17	...	...	...	...	...	...	...	...	...	...	...	4	15	12	2	...	...	29S. 77W.	17·87	—0·08	—12·95	—3·30	—18·71
August ,,	745	765	77	78	9·96	9·56	19	...	...	...	...	...	...	...	...	...	...	...	25	3	4	1	1	...	29S. 51W.	16·17	—0·07	—11·61	—2·95	—16·83
September ,,	703	718	67	61	9·13	8·70	9	1	2	1	1	2	1	1	...	...	1	12	6	7	10	13	3	...	28N. 79W.	13·58	+0·21	—7·93	—0·56	—9·13

It will be noticed how intensely hot the temperature of the air is during the months of April and May. The highest reading of the thermometer in the shade took place on the 11th May 1881, when it reached 113·5.

The rains usually commence in the latter end of June and last until September. The average annual fall (mean of 19 years) is 36·38 inches. This is 5 inches more than at Mhow and 15·34 inches more than at Nasirabad.

This condition is probably produced by the neighbouring high land of the Upper Málwa plateau causing the condensation of the vapour with which the south-west wind is laden. The months of September and October are most trying; for although the force of the monsoon wind has abated, the atmosphere together with the sub-soil is still laden with moisture, and the temperature by day is still high, whilst there is a sudden rise in the range between it and that recorded to have occurred during the night, the nocturnal fall being occasioned probably by currents of cold air draining off the slopes of the neighbouring Málwa plateau and flowing down the valley as a cold wind during the night and early morning, and it is at this season that fevers become most rife, attacking Europeans and Natives alike.

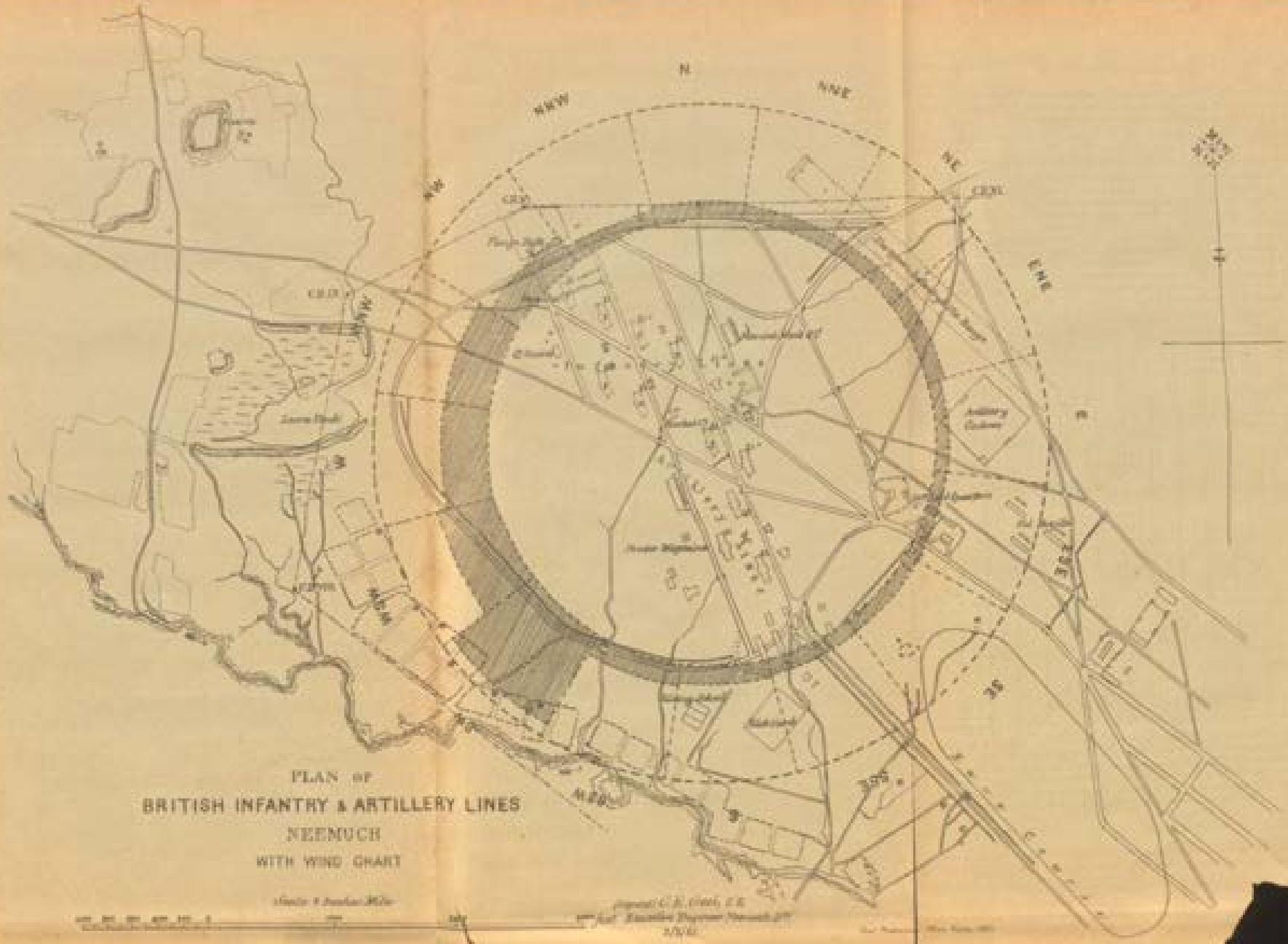
The following rain return is compiled from the records of the Staff Hospital:—

Year.	January		February		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.	
	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.	Inches.	Cents.
1861 ..	..	..	..	..	..	..	..	..	..	80	6	20	15	61	17	92	5	32	..	..	..	..	..	..	46	50
1862 ..	..	..	..	..	..	..	..	..	..	12	8	61	34	34	3	16	13	..	1	45	..	48	..	..	51	4
1863 ..	..	..	23	..	..	..	..	..	..	51	7	60	15	69	5	71	7	50	..	..	..	12	..	..	56	77
1864 ..	..	..	..	1	27	..	..	..	6	1	58	1	58	18	21	10	47	5	78	..	6	..	..	..	68	40
1865 ..	..	..	21	..	..	1	73	10	..	..	..	1	66	..	..	22	64	1	30	..	69	..	..	..	41	76
1866 ..	..	..	7	..	..	..	..	..	15	..	5	9	28	8	4	6	15	..	..	..	..	..	..	..	27	79
1867 ..	..	..	..	..	..	..	..	..	8	..	26	..	26	9	3	19	46	..	..	..	..	..	..	..	29	79
1868 ..	..	..	..	..	..	..	..	..	..	8	1	79	9	87	4	32	..	55	..	3	..	..	..	..	16	32
1869 ..	..	..	..	..	..	..	..	..	..	..	..	60	16	6	8	77	14	52	..	55	..	..	..	..	25	51
1870 ..	..	..	..	..	..	..	..	..	..	1	99	6	54	9	51	2	60	3	12	..	96	..	..	..	33	34
1871 ..	..	..										No	record.													
1872 ..	..	..												Do.												
1873 ..	..	..												Do.												
1874 ..	..	..	..	..	..	..	..	..	..	60	6	35	15	29	21	43	13	35	..	..	..	..	..	..	34	99
1875 ..	..	..	..	..	..	..	..	..	..	50	2	54	14	90	4	46	23	66	..	23	..	..	..	..	41	81
1876 ..	..	..	..	..	..	..	..	..	..	..	..	9	6	54	10	34	16	12	..	..	..	23	..	..	33	25
1877 ..	..	..	..	1	99	..	..	..	..	43	1	44	3	25	..	79	2	19	6	93	..	..	..	..	17	39
1878 ..	..	..	10	..	..	..	3	..	..	12	2	96	10	47	17	98	8	77	..	..	..	..	..	..	43	14
1879 ..	..	..	..	1	40	..	..	..	..	10	4	92	5	17	11	80	4	20	..	39	..	..	..	..	28	7
1880 ..	..	..	..	..	..	..	..	..	..	1	62	5	71	15	70	4	73	11	74	..	56	..	..	..	39	76
1881 ..	..	..	..	..	58	..	33	..	..	..	30	4	61	10	60	10	..	1	15	..	..	..	..	1	25	30	73
1882 ..	..	..	..	..	30	..	..	..	..	..	61	4	55	12	52	5	84	6	42	..	15	..	6	..	30	25	73
Mean ..	..	3	..	26	..	11	..	70	..	46	4	2	12	36	10	98	7	45	..	62	..	5	..	9	36	38

The wind chart on the opposite page, for which I am indebted to Mr. Gael, shows the directions from which the winds blow at Neemuch, and it has been projected over the lines of the European troops to show how the wind affects the barracks. During the cold weather, northerly and easterly winds prevail; but the west-south-westerly breeze usually commences in April and the south-west wind in May, and blows steadily from this point up to the end of the rains.

European Garrison.

The European troops at present (October 1882) quartered at Neemuch are the B/2 Royal Artillery, which arrived in India on the 19th February 1875 and



PLAN OF

BRITISH INFANTRY & ARTILLERY LINES

NEEMUCH

WITH WIND CHART

at Neemuch on the 19th March 1882 from Belgaum, and a Detachment of the 1st Worcestershire which landed in India on the 1st March 1879,—the Detachment arriving at Neemuch from Mhow on the 13th March 1881.

The ages of the men in each corps on the 1st July 1882 were as follows :—

Years of Age.	17	18	19	20	21	22	23	24	25	26	27	28	29	30 and over	Total.
B/2 Royal Artillery ...	1	1	...	5	7	3	11	15	10	20	13	11	20	43	160
Detachment, 1st Worcestershire Regiment ...	...	...	...	11	14	24	59	68	39	23	13	12	12	41	316

and the length of total service in each corps in October 1882 is shown in the next table :—

Total Service.	Under 1 year.	1 and under 2.	2 and under 3.	3 and under 4.	4 and under 5.	5 and under 6.	6 and under 7.	7 and under 8.	8 and under 9.	9 and under 10.	10 and under 11.	11 and under 12.	12 and under 13.	13 and under 14.	14 and under 15.	15 and under 16.	16 and under 17.	17 and under 18.	18 and under 19.	19 and under 20.	20 and under 21.	Total.
B/2 Royal Artillery ..	8	6	14	11	13	14	10	6	17	9	14	13	1	1	3	3	3	3	...	4		160
Detachment, 1st Worcestershire Regiment ...	..	8	15	20	30	129	34	3	...	...	4	8	10	2	3	1	4	4	7	1	4	303

The length of service in India being as follows :—

Service in India.	Under 1 year.	1 and under 2.	2 and under 3.	3 and under 4.	4 and under 5.	5 and under 6.	6 and under 7.	7 and under 8.	8 and under 9.	9 and under 10.	10 and upwards.	Total Strength.	Remarks.
B/2 Royal Artillery.	12	24	14	8	9	6	13	56	6	...	2	160	Previously served in India, 12.
Detachment, 1st Worcestershire Regiment ...	25	27	12	231	4	...	...	...	...	4	...	303	Do, do. 8.

The European Barracks.

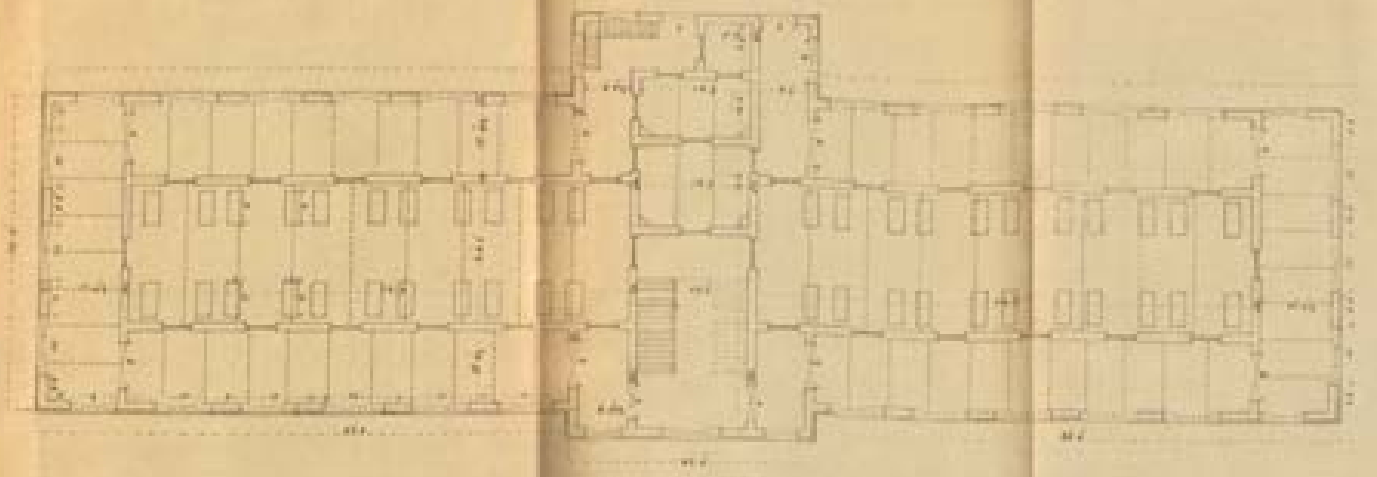
A reference to the sketch map shows that these buildings are situated on the confines of the Cantonment and on the highest or north-west end, on a line fronting the south-west. The Infantry barracks occupy the most northerly position. They are 8 in number—2 being used as a Station Hospital for men, and half of another as a hospital for women. They are built in *echelon* in 5 rows. I learn from the Quarter Master General of the Army that they were, for the most part, erected in 1870 and 71, and that one barrack was built in 1873.

The Artillery barracks, 3 in number, adjoin them, but on a slightly lower level. They were first occupied in September 1876. One of the Infantry barracks is built of brick, but all the remainder of limestone. They are on the latest standard plan, and have well-raised plinths 2 or 3 feet above the ground. The general construction will be seen from the accompanying plan and section of the Artillery barracks, which in all main points assimilate with the Infantry, —the only material difference being that the Infantry barracks have tiled roofs with continuous ridge ventilators, whilst the Artillery have arched brick roofs between iron girders, and stone slabs over the verandahs.

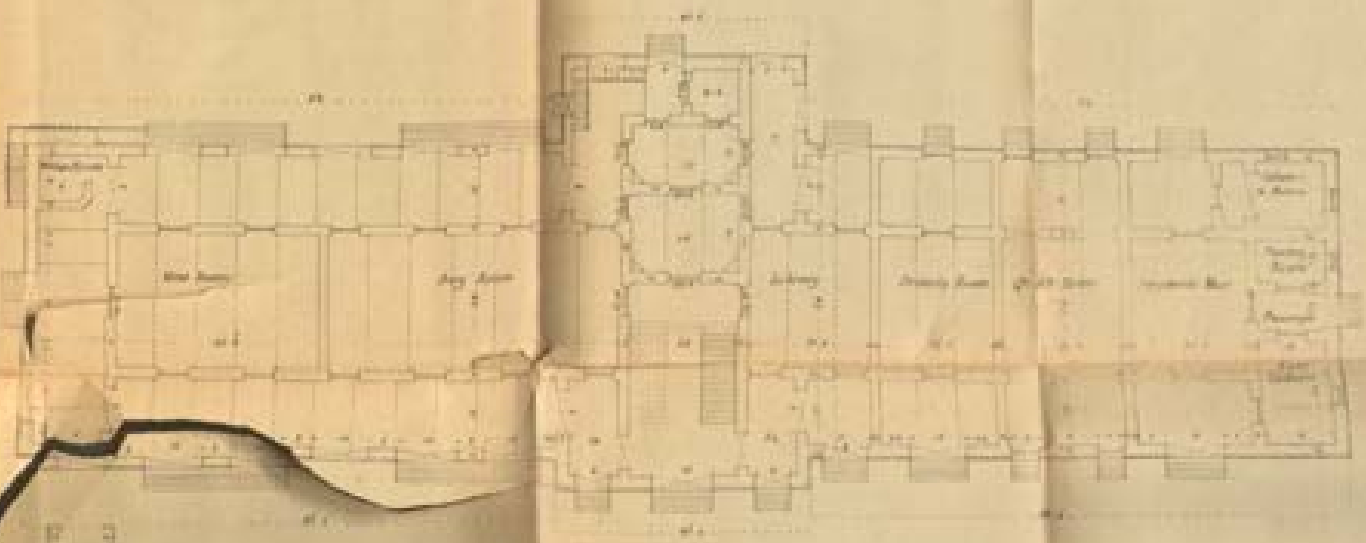
The buildings in point of construction are, as regards ventilation, accommodation, superficial and cubic space, excellent in every way.

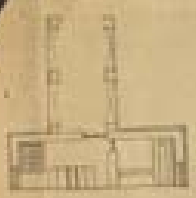
There is, indeed, one radical defect about them, *viz.*, that they are not built on raised basements about 3 or 4 feet high, so that a current of air might circulate below them. This plan of construction was laid down by the Royal Sanitary Commission many years ago as the *very first* point to be attended to in building barracks in a malarious country like India, and the necessity for it has always been strongly insisted upon by the Army Sanitary Commission; but I regret to say that, at all events in the Bombay Presidency, though frequently urged by the sanitary advisers of Government, it has been entirely neglected, to the great detriment, in my opinion, of the health of the troops. The intention of the Government of India no doubt was, when these barracks were constructed, that the upper floors only should be used as dormitories. This intention has, however, as regards the Infantry been frustrated in practice, as a large proportion of the Detachment sleep on the ground-floor; but, even if the lower stories are not used as dormitories without an air space of at least 3 feet between the ground and the floor of the lower story, there can be no sufficient protection to prevent moisture being drawn up by capillary attraction through the earth. It is not sufficient to run air-shafts through the plinth from side to side. What is wanted is entire disconnection with the soil and the free circulation of air under the floor. I am under the impression that the large additional outlay necessary to provide raised basements, is the real reason why the above recommendation of the Royal Sanitary Commission has not been carried out; but, surely, Government lose more by ill-health and invaliding by refusing to carry out what, there is no doubt, would be one of the most efficient measures to prevent disease. None of the barracks are furnished with eaves or downtakes, and the consequence is that all the storm water falling on the roofs falls on to the ground, to be absorbed as best it may. The Executive Engineer informs me that in the Infantry barracks the rain forces its way through the continuous ridge ventilator, and that the tiles procurable in this part of the country are so extremely bad and porous that it is impossible to prevent their becoming saturated. He also says that rain beats in through the clerestory windows, and that, as the barracks are in such an exposed position, the heavy rain not only pours in through the arched openings, and floods the verandahs, but actually soaks through the external walls into the barrack rooms. The men complain very much of the discomfort produced from this cause, and I think Mr. Gael's suggestion of defending the clerestory windows by a stone weather-frame should be carried out. I recommend that the openings of the arched verandahs on the windward side be provided with windows or with vertically revolving venetians, such as have been fitted at the Goculdass Tejpall Hospital in Bombay. This action is, in my opinion, most necessary, as there can be no doubt that during the rains the barracks are too draughty. He also proposes to substitute a corrugated iron roof with plank ceiling for the tiles, or an improved tile such as the Mangalore tile in the Infantry barracks, and he has lately introduced a plan of placing tiles over the cracks in the roofs and verandahs of the Artillery barracks, which promises to be effective. It must always be remembered that in India there are three seasons—the hot, the rainy, and the cold, and it is most difficult to construct any building which shall answer perfectly throughout the year. As, however, there is no doubt that a damp barrack must act most injuriously on the health of the men, I think the subject is a very urgent one, and hope that Mr. Gael's suggestion of corrugated iron roofs may at once be taken in hand. If corrugated iron cannot be provided for the entire roof, if it were at least applied to the ridge, it would prevent the entrance of rain through this opening.

Plan of Upper Floor No 1 2 3

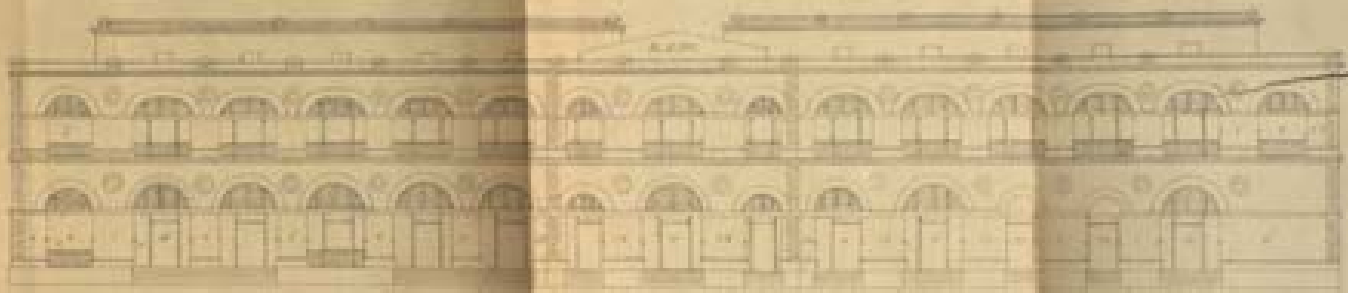


Plan of Ground Floor No





Elevation No 3



Executive Engineer

It is obvious, too, that the outer verandahs, both on the upper and lower story, must be protected from rain, and I would suggest that the outer walls be washed over with some of those silicated compositions which render walls impervious to damp. I also consider that it is most important that eaves and downtakes be provided to carry off the roof water to a paved drain, to discharge at some distance from the barracks.

The soil on which the barracks actually stand, is red laterite; but on the slope of the ground contiguous to them towards the west-south-west, is a portion of land about a quarter of a square mile in area which has undergone decomposition and is merging into black cotton soil. It, in my opinion, retains moisture, and after heavy rain is spongy. On the south-east of the barracks is a large patch of black soil, over which is the race-course, whilst on the north it will be remembered the surface is wholly black cotton soil The entire drainage is surface, and the storm water to the west of the barracks is carried off by a nála, which is discharged into one of the tributaries of the Leora Nála. The rain falling on the west of the axial ridge is also carried off by nálás, which, though sufficient to remove the storm water running over the surface, do not affect that which is absorbed into the sub-soil, which is consequently but slowly drained,—a process which takes many months before the ground lower than the bottom level of the surface nála is dry.

On the west-south-west of the barracks, and immediately below them, is a tank, called the Leora Tank, which has been formed by building an earthen embankment across the bed of a nála. I am informed by the Executive Engineer that it is about 1,400 feet long by 700 feet broad when full, and, as stated in Mr. Lumsdaine's report, "commencing on the right flank it is distant from the Hospital 1,870 feet, from the Quarter Guard 1,610 feet, from No. 7 barrack 2,080 feet, from No. 5 barrack it is 1,940 feet, and 2,200 from No. 4; from the nearest Artillery block it is 2,500 feet."

It is, of course, at a lower level than the barracks, the height of the floor of the Hospital being, however, only 15 feet above the tank surface. It is fed by 2 nálás, up each of which the water is ponded back for some distance. The earthen dam not having been properly puddled, is not water-tight, and, consequently, a not inconsiderable amount of leakage takes place; and the soil over a large area below the dam is during the monsoon marshy, and remains so for months after it, a slow ooze taking place through the dam. It may be conceded that the sides of the tank are clean, except perhaps on the north, where there is much coarse grass; but as the surface of the tank, which is about 12 feet deep, dries up, a considerable superficies of wet ground is exposed. I differ from Mr. Lumsdaine in his opinion that this tank is not hurtful, for the reason that it arrests the flow of sub-soil water, and consequently prevents its ready escape, and thus tends to keep the ground near the barracks damp. The ground below the tank is distinctly a malaria-producing source.

In my opinion the patch of ground in front of the barracks as well as that below the road and the main drainage nála should be provided with sub-soil drains, and all this tract, as well as the rising ground along the north and round to the east of camp should be thickly planted with trees.

I shall have occasion to refer, further on, to this subject; but in the meantime the following observations, taken under Surgeon Major O'Farrell's orders, in accordance with my request to the Quarter Master General of the Army, of the temperature and state of the sub-soil near the barracks will be read with interest:—

No. 1 Pit.

Situation—Close to No. 5 Block.

Infantry Barrack.

Laterite stone of inconsiderable size found at the depth of about 4 feet; soil—red, clean and free from all impurities.

Temperature taken by the meteorological observer at 6 P. M. on the 28th September 1882—

Temperature of external air	... ...	90°·3
Do.	at bottom of the pit	89°·7
Do.	6 inches below the surface	89°·2
Do.	on ground outside pit	89°·8

Observation taken 12 hours after rain—

Amount of moisture in earth, 56 grains per ounce.

Temperature taken on the 30th September 1882 at 6 A. M.—

Temperature of external air	... ...	74°·7
Do.	bottom of the pit	73°·5
Do.	6 inches below the surface	73°·6
Do.	on ground outside pit	73°·1

October	12th.—Amount of moisture in earth 8 days after rain,			52	grains per ounce.
	13th	do.	9 „	55	do.
	14th	do.	10 „	57	do.
	15th	do.	11 „	58	do.
	16th	do.	12 „	58	do.
	17th	do.	13 „	53½	do.
	18th	do.	14 „	51½	do.
	19th	do.	15 „	50	do.

No. 2 Pit.

Situated in centre of superficial drain close to No. 4 Block, Infantry Lines.

Soil—laterite; water found at the depth of 4 feet. Amount of moisture in earth, 39 grains per ounce.

4th October 1882.—Amount of moisture in earth, 58 grains per ounce, taken 8 days after rain.

October	12th—Amount of moisture in earth 8 days after rain,			42	grains per ounce.
	13th	do.	9 „	do. 43	do.
	14th	do.	10 „	do. 43	do.
	15th	do.	11 „	do. 45	do.
	16th	do.	12 „	do. 45½	do.
	17th	do.	13 „	do. 45½	do.
	18th	do.	14 „	do. 46	do.
	19th	do.	15 „	do. 46	do.

No. 3 Pit.

Near Patcherry.

Soil—laterite. Stones of considerable size found about 4 feet under the surface.

Soil—red, clean and apparently free from all impurities.

Temperature taken by meteorological observer at 6-15 P. M.—

Temperature of external air	... ...	88°·8
do.	bottom of the pit	89°·0
do.	6 inches below the surface	88°·8
do.	on ground outside pit	88°·9

Amount of moisture in earth, 44 grains per ounce, taken 24 hours after rain.

Temperature taken on the 30th September 1882 at 6-15 A. M.—

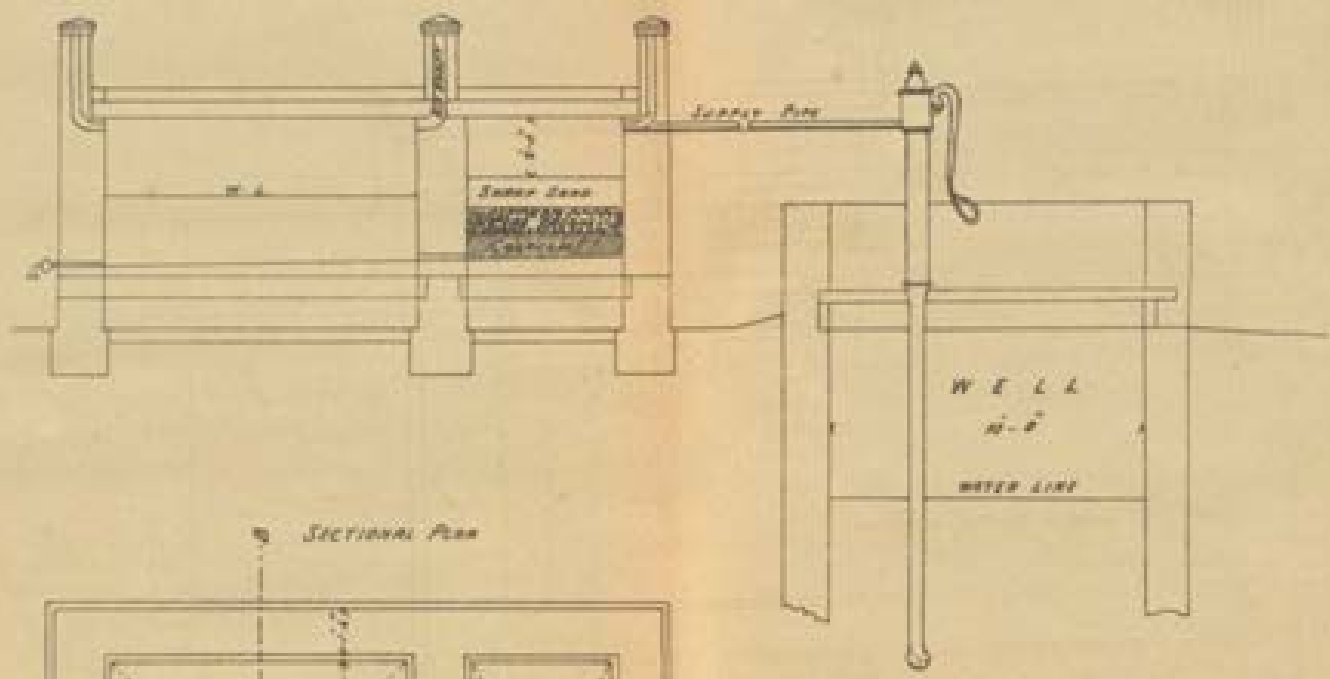
Temperature of external air	... ...	70°·5
do.	bottom of the pit	71°·6
do.	6 inches below the surface	72°·6
do.	on ground outside pit	72°·21

October	12th.—Amount of moisture in earth 8 days after rain,			44	grains per ounce
	13th	do.	9 „	44½	do.
	14th	do.	10 „	45	do.
	15th	do.	11 „	46½	do.
	16th	do.	12 „	47	do.
	17th	do.	13 „	47½	do.
	18th	do.	14 „	47	do.
	19th	do.	15 „	47½	do.

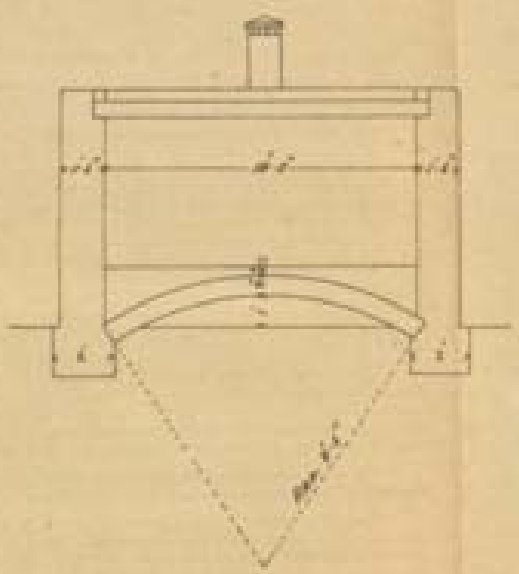
Plan of Filter and Tank

E.I. Lines Neemuch

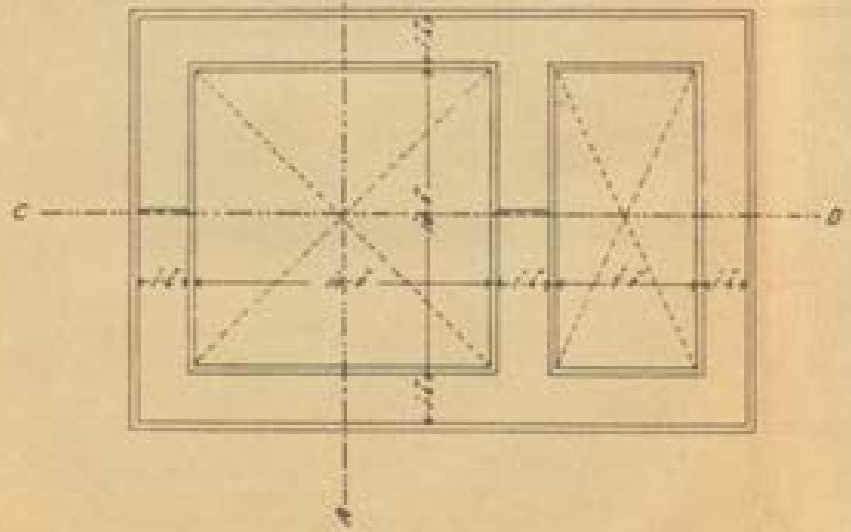
Section on C.D.



Section on A.B.



Sectional Plan



Scale of 8 feet to an inch

19th S.R.

No. 4 Pit.

Situated close to No. 2 Block.

Royal Artillery.

Soil—laterite. Very large stones 4 feet from the surface. Soil—red, clean and apparently free from all impurities.

Temperature taken by meteorological observer at 6-30 P. M.—

Temperature of external air	88°·
do. bottom of the pit	87°·7
do. 6 inches below the surface	87°·4
do. on ground outside	86°·9

Amount of moisture in earth, 50 grains per ounce.

Temperature taken on the 30th September at 6-30 A. M.—

Temperature of external air	74°·
do. bottom of the pit	74°·6
do. 6 inches below the surface	75°·0
do. on ground outside pit	76°·0

October 12th.—Amount of moisture in earth 8 days after rain, 45 grains per ounce

13th	do.	9 „	45	do.
14th	do.	10 „	45½	do.
15th	do.	11 „	45	do.
16th	do.	12 „	46	do.
17th	do.	13 „	45½	do.
18th	do.	14 „	46	do.
19th	do.	15 „	46½	do.

Water-supply.

Mr. Gael has kindly furnished me with the following note on the water-supply :—

" The water-supply of Neemuch Cantonment is practically dependent upon its wells, which are, for the most part, simply sunk through the surface soil down to, or just penetrating into, the underlying trap rock. In years of ordinary rainfall the supply from this source is sufficient and tolerably good; but in years of deficient rainfall a scarcity is soon apparent in the wells. This was the case in the hot season of 1878 following deficient rains in 1877, and was also observable in a mitigated form in the hot weather of 1879. To keep the water level higher, the expedient has been adopted of throwing dams across the two rivers that drain the camp. That on the north-eastern side, commonly called the Parade Nála, is dammed by the causeway at Kanouti on the Nasirabad road, and one or two temporary dams of small height are thrown up at various other points. That on the south-west side has the Leora Tank dam, a masonry dam in the Commissariat Garden (this is imperfectly constructed, and is not water-tight), and a temporary earthen dam thrown at every season opposite the bázár.

" These, no doubt, tend to keep up the general water level, and are, so far as they are effective, beneficial; but they are not sufficient. To deepen wells in the trap rock is very expensive, and the results obtained are not commensurable with the expense. A more efficacious arrangement would be a judicious selection of localities for a few new wells that could be sunk free of the trap to a considerable depth, which would ensure a fair supply.

" The water might be raised by a steam-power to a permanent reservoir at a sufficient height to allow of service distribution to upper stories by gravitation.

" The potable water for the troops is drawn from a covered well in the close vicinity of the hospital by means of a rotary force and lift-pump and passed through 2 feet of filtering material consisting of sharp river sand of varying degrees of fineness and charcoal into a masonry reservoir, from which it is drawn off by means of a stop-cock. The depth of filtering material and head of water above it have been designed in accordance with the usual practice.

" This supply will give, at one filling of the filter and tank, 9 gallons per head per day in the usual strength of the British troops."

The total number of wells in the Cantonment is 206, of which 27 are in the Sadar Bázár and the remainder in different parts of the station. One hundred and four belong to private individuals and 102 are public property. Three have steps leading down to them. Thirty are provided with covers, and the remainder are open. One hundred and seventy are said to yield sweet water, the rest being brackish—in my opinion the result of surface filth finding its way into them.

The following analyses of the well waters at Neemuch were made by Assistant Surgeon Kaka, Travelling Water Analyst, in January 1883 :—

Number of Samples	Date.	Station.	Source.	Grains per Gallon.		Parts per Million.		Sediments, &c.	Quality.
				Total Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia.		
1	Dec. 27th 1882.	Neemuch	Old Royal Artillery Lines. No. 2 well, near Native Cavalry Hospital.	46·0	5·14	Nil	·06	Scanty, vegetable debris, paramœcia.	Good.
2	Do. ..		Well No. 2, east of No. 2 Barrack.	79·8	18·72	Nil	·07	Copious, vegetable debris, paramœcia, crystals of mineral matter.	Bad.
3	Do.		Do. No. 4, near old Royal Artillery plunge-bath.	119·	16·1	Nil	·07	Scanty, vegetable debris, crystals of mineral matter	Do.
4	Do.		Do. No. 5 do.	140·4	25·34	·005	·07	Do. do. do.	Do.
5	„ 28th.		Do. No. 6, Native Cavalry Lines.	81·9	13·0	·005	·08	Do. do. do.	Do.
6	Do.		Do. No. 7 do.	34·3	3·15	Nil	·04	Scanty, vegetable debris, paramœcia.	Good.
7	Do.		Do. No. 8 do.	97·	2·38	Nil	·06	Do. do. do.	Do.
8	Do.		Do. No. 12, Native Infantry Lines.	44·8	5·74	Nil	·07	Do. do. monads .	Do.
9	„ 29th.		Do. No. 13 do.	51·8	5·99	Nil	·04	Do. do. do.	Fair.
10	Do.		Do. No. 14, near Native Infantry Hospital.	27·3	2·1	·005	·04	Do. do. do.	Good.
11	Do.		Do. No. 19, general parade ground.	27·3	2·69	Nil	·14	Copious, vegetable debris, paramœcia, rotifera.	Bad.
12	Do.		Do. No. 10 do.	26·8	2·1	Nil	·04	Scanty, vegetable debris, monads, paramœcia.	Good.
13	„ 30th.		Do. No. 24, near baystack, Royal Artillery	27·6	3·3	Nil	·06	Do. do. paramœcia	Do.
14	Do.		Do. 25, outside Fort	30·4	3·95	·008	·04	Very scanty, vegetable debris, monads.	Do.
15	Do.		Do. No. 30, near Native Infantry Officers' Mess.	34·2	2·21	·0132	·035	Do. do. do	Do.
16	Do.		Do. No. 32, inside Fort	30·8	3·29	·005	·04	Do. do. do.	Do.
17	„ 31st.		Do. No. 37, near patchery (R. G.)	29·4	2·59	·005	·06	Do. do. do.	Do.
18	Do.		Do. No. 37a, plunge-bathe (R.I).	29·	2·24	·0132	·08	Do. do. do.	Do.
19	Do.		Do. No. 38, hospital filter	34·3	2·2	·005	·05	Very scanty, vegetable debris, monads.	Do.
20	Do.		Do. filter tap	34·2	2·2	Nil	·04	Do. do. do.	Do.
21	Jan. 1st, 1883		Do. monsock	34·2	2·2	·005	·08	Vegetable debris, monads, paramœcia.	Do.
22	Do.		Do. filter tub, Station Hospital.	34·2	2·2	·005	·08	Do. do. do	Do.
23	Do.		Do. Macnamara filter in ditto	34·2	2·2	Nil	·04	Nil	Do.
24	Do.		Do. monsock No. 2	34·2	2·2	·005	·10	Copious, vegetable debris, monads, paramœcia, vorticella, monads, rotifera.	Bad.
25	„ 2nd		Do. monsock No. 3	34·2	2·2	·005	·11	The same as above	Do.
26	Do.		Do. barrel of rock-room, Station Hospital.	34·2	2·2	·013	·15	Do. do. ..	Do.
27	Do.		Do. No. 39, near plunge-bath, Royal Artillery.	30·8	2·05	·008	·05	Scanty, vegetable debris, monads, paramœcia.	Good.
28	Do.		Do. in Jamsejí's compound near Cocanie-artel godown.	34·2	1·96	Nil	·04	Very scanty, vegetable debris, paramœcia.	Do.
29	„ 3rd ..		Well in, Cawasji's	27·3	2·63	·0132	·07	Scanty, vegetable debris, monads, paramœcia.	Do.
30	Do.		Do. in Lieut. Tinley's compound.	51·1	4·34	Nil	·04	Do. do. do. ..	Fair.
31	Do.		Do. Dr. Young's compound Bizár wells.	34·2	2·87	Nil	·04	Do. do. do.	Good.
32	Do.		Well, Chumar's (on bank of river).	50·	7·07	·026	·03	Vegetable debris, paramœcia	Fair.
33	„ 4th ..		Do. Idgah ..	51·3	8·	·005	·07	Scanty do. do.	Do.
34	Do. ..		Do. on Shirghad road	57·2	8·95	·008	·043	Very scanty, vegetable debris, monads ..	Good.
35	Do. ..		Do. Mubarki bowe ..	40·6	5·13	·005	·08	Vegetable debris, monads, paramœcia	Do.
36	Do.		Do. Faroghe's in Poorigunj	79·8	8·47	·0132	·09	Scanty, vegetable debris, crystals of carbonate of lime.	Bad.
37	„ 5th ..		Do. Ramdas Kalla's ..	415·2	69·95	·0132	·12	Copious, vegetable debris, monads, paramœcia, rotifera, crystals of carbonate of lime.	Do.
38	Do. ..		Do. opposite station ..	27·3	1·82	·0132	·07	Copious, vegetable debris, monads, paramœcia.	Good.
39	Do. ..		Do. Kumbarwala	80·1	12·95	·026	·08	Vegetable debris, monads, crystals of mineral matter.	Bad.
40	Do. ..		Do. Sudhoo Shett's	41·6	6·65	Nil	·06	Scanty, vegetable debris, crystals of mineral matter.	Do.
41	„ 6th ..		Do. Moosdurkhana's, near Lock Hospital.	50·	5·25	·0132	·07	Scanty, vegetable debris, monads.	Fair.
42	Do. ..		Do. Nawab of Jaora	39·1	4·9	·005	·07	Do. do. do.	Do.
43	Do. ..		Do. covered in Tall St. ..	67·2	8·51	·0132	·11	Copious, vegetable debris, monads, paramœcia, entromostraca, crystals of mineral matter	Bad.
44	Do. ..		Do. Cuverji's well	57·4	4·9	·0132	·05	Scanty, vegetable debris, paramœcia, crystals of mineral matter.	Fair.
45	„ 7th ..		Do. Kahar's, in river bed ..	110·6	20·18	·052	·10	Copious, vegetable debris, monads, paramœcia, rotifera, cuplotes, entromostraca rotifers, crystals of mineral matter.	Bad.
46	Do. ..		River near Kahar's well ..	39·3	5·6	·106	·14	Copious, vegetable debris, monads, paramœcia, rotifera.	Do
47	Do. ..		Do. above station ..	39·9	5·07	·106	·29	Do. do. do.	Do.
48	Do. ..		Do. at bridge near station ..	422·8	212·6	·26	·7	Do. do. do.	Do.
49	„ 8th ..		Water from prostitute's house in No. 282 in Burra Chuckla.	47·6	5·46	·052	·15	Do. do. do.	Do.
50	Do. ..		Do. from house No. 306 in Chota Chuckla	44·9	4·41	·026	·14	Do. do. do.	Do.
51	Do. ..		Do. from house No. 320 in Chota Chuckla.	51·6	5·95	·052	·18	Do. do. do.	Do.
52	Do. ..		Soda-water from Messrs. Ferozsha & Co.	30·9	2·21	·026	·10		Fair.
53	„ 9th ..		Do. from Mr. Ali Mahomed	220·4	19·6	·026	·18		Bad.
54	Do. ..		Well near Pirni Towers of Silence.	30·8	1·68	·0132	·07	Scanty, vegetable debris, paramœcia.	Good.

The above analyses show that, for the most part, the well waters in the Military

lines are good and wholesome, as is usually the case in a laterite formation, but the porous character of the rock renders the water peculiarly liable at any time to become polluted from the percolation of impure matters into it. The deterioration water suffers from being carried in a mussook and being kept in the wooden filter tub or in barrels in the cook-rooms is also demonstrated; and I can only repeat the advice given in my report on Nasirabad Cantonment as to the advisability of entirely doing away, at least in Cantonments, with the leathern mussook; and I consider Mr. Gael's suggestion regarding raising water by pumping to a reservoir, and distributing it to the barracks by gravitation, a very excellent and practical one. If steam-power is considered to be too expensive, perhaps the Commissariat elephants or bullocks might be employed.

The following table, which has been furnished by Mr. Gael, showing the water levels and depth of water in the wells in the Military lines, is very instructive:—

Water Levels and Depth of Water in Wells in the Military Lines, Neemuch.

Line in which situated.	Locality.	Number of Wells.	Position of Bench Mark.	Height of Bench Mark above subsoil water level.	Depth from Bench Mark to Surface of Water.	Depth of Water, 1881. 1st week end. January.	2nd.	3rd.	4th.	1st week end. February.	2nd.	3rd.	4th.	1st week end. March.	2nd.	3rd.	4th.	1st week end. April.	2nd.	3rd.	4th.	1st week end. May.	2nd.	3rd.	4th.	1st week end. June.	2nd.	3rd.	4th.	1st week end. July.	2nd.	3rd.	4th.	1st week end. August.	2nd.	3rd.	4th.	1st week end. September.	2nd.	3rd.	4th.	1st week end. October.	2nd.	3rd.	4th.	1st week end. November.	2nd.	3rd.	4th.	1st week end. December.	2nd.	3rd.	4th.
Old Royal Artillery Lines	Soldiers' Garden	1	U.S.	3	39	7	5	43	42	4	3	54	54	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39
Do. do.	In front of patchery	2	U.S.	3	45	16	14	15	114	54	4	5	90	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
.....	East of No. 2 Barrack	3	U.S.	3	29	3	2	1	1	Dried.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
.....	Old plunge-bath well	4	U.S.	3	27	24	24	2	7	7	6	5	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154	154
.....	Near barrens	5	U.S.	3	28	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Cavalry Lines	Near Sick Horse Stable	6	U.S.	3	33	14	15	12	10	64	3	2	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214	214
Do. do.	Near burial-ground	7	U.S.	3	35	10	10	10	9	6	5	6	18	20	17	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
.....	Do. do.	8	U.S.	3	32	11	9	8	7	6	4	4	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
.....	North-west of burial-ground	9	U.S.	3	29	11	10	7	6	4	4	6	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
.....	Mussook well	...	U.S.	3	30	8	7	6	5	4	3	3	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Old Royal Artillery Lines	In front of old Royal Artillery Hospital	10	U.S.	3	29	10	9	8	7	6	5	5	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Native Infantry Lines	Near Native Infantry Blair	11	U.S.	3	33	14	10	7	6	3	2	1	24	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Do. do.	Do. Female Ground	12	U.S.	3	32	9	8	7	6	5	4	4	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
.....	Do. do.	13	U.S.	3	30	7	6	6	5	4	3	3	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
.....	Near Native Infantry Garden	...	U.S.	3	29	12	10	9	8	7	6	6	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Old European Infantry Lines	Near Native Infantry Hospital	14	U.S.	3	37	10	9	8	7	6	5	5	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
.....	Well in front of Native Infantry Hospital	15	U.S.	3	41	11	9	7	6	5	4	4	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
.....	Do. do.	16	U.S.	3	37	8	6	5	4	3	2	2	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
Old European Infantry Lines	Old plunge-bath well	18	U.S.	3	34	12	10	9	8	7	6	5	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Do. do.	Do. do.	19	U.S.	3	36	10	9	8	7	6	5	5	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Do. do.	Near old European Infantry patchery	20	U.S.	3	33	11	10	9	7	6	4	4	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Do. do.	Do. do. do.	21	U.S.	3	34	10	11	10	9	8	7	6	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Do. do.	Do. do. do.	22	U.S.	3	38	9	8	7	6	5	4	4	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Race-course	Near Officers' quarters, European Infantry	23	U.S.	3	31	13	9	9	7	6	5	5	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Royal Artillery Lines	Near bar-stack	24	T.P.	3	31	12	10	9	8	7	6	5	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Lancer Line	Near huts	24C	U.S.	3	32	7	6	6	5	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Do.	Do. east of huts	24D	T.P.	3	34	43	42	41	39	38	37	36	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118	118
Do.	Do. behind Race-stand	24D	U.S.	3	34	5	4	4	3	3	2	2	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Do.	Do. Artillery servants' quarters	24A	T.P.	3	30	34	5	43	34	34	3	3	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Fort	Outside of Fort	25	U.S.	3	38	17	109	98	87	76	65	54	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Lawrence	Lawrence compound near Fort	27	U.S.	3	28	3	2	2	2	2	2	2	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Compound	Lawrence Bungalow	27A	T.P.	3	30	34	44	4	4	34	34	3	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
.....	Old compound well	28	U.S.	3	44	5	4	4	4	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
.....	Do. facing Fort	29	T.P.	3	45	5	44	4	34	3	3	3	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Old compound	Near Mess of Native Infantry Officers	30	U.S.	3	28	10	9	8	7	6	5	5	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Fort	Wells in Fort	32	U.S.	4	43	17	16	134	14	17	12	12	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
Do.	Do. do.	33	U.S.	4	37	14	13	13	12	11	10	9	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Commissariat Line	Turn of New Neemuch Road	36	U.S.	3	32	11	11	10	9	8	7	6	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
Royal Artillery	Near patchery, Royal Artillery	37	U.S.	3	34	13	12	11	10	9	8	7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
European Infantry Lines	Plunge-bath well	37A	U.S.	3	34	13	12	11	10	9	8	7	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Do. do.	Hospital filter well	38	U.S.	3	47	31	29	29	29	26	25	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Royal Artillery Lines	Plunge-bath well	39	U.S.	3	30	19	18	17	16	15	14	13	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
.....	Old Church compound well	...	U.S.	3	30	7	6	5	5	4	3	3	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
.....	Chwaujee's well	...	I A	T.P.	34	36	31	27	26	24	3	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11

The hospital filter well, from which the troops are supplied, even in the end of the hot season has an abundant supply, the depth of water on the 7th July being 25 feet.

The bottom of the well is far below the level of the nála, and in my opinion the gathering ground of this well extends as far north as the highest ridge at Keraúda. If this be so, the condition of the surface between the well and the villages on the north, which are outside Cantonment limits, is a matter of most vital importance. This well is covered with stone slabs, but at the time of my visit one of these had been removed for the purpose of repairing the pump. There was much dirt on the raised stone platform outside, which might have easily fallen or been blown into the well.

The wastage water is discharged through a chunamed gutter into the road-side drain, which was very filthy and covered with a green scum. The sand for the filter is supplied by the Commissariat Department. On one occasion I found it deposited on the pavement round the well, and among it was cowdung, which had been dropped by a bhisti's bullock.

In my opinion the sand for all filters should be provided by the Executive Engineer, and not by the Commissariat. Mr. Gael procures sand for his own filter from a distance of 25 miles. The ordinary river sand is most dangerous for use. The well below the Commissariat cattle-yard deserves especial notice, as it is the only well with which I am acquainted at which the directions of the Army Sanitary Commission have been partially carried out, as Mr. Gael has fixed over it a masonry dome in which there are openings for a windlass, iron chain and bucket to be fixed. The parapet wall is so high above the pavement round the well that the drawers of water cannot stand upon it. In fact, if the tube of this well had been covered externally with a thick casing of concrete, it would have been a model well.

The following is Mr. Gael's description of it :—

"The well vaulting is a dome of brick work of diameter suited to that of the well. For ordinary dimensions the slope is sufficiently steep to prevent the use of the well covering as a standing place for ablution, or for washing clothes or utensils, as is commonly the case on the flat coverings.

"A small circular opening may, if necessary, be left for ventilation in the crown of the dome; oval arched openings may also be made lower down, provided there is no tension at the points. The ratio of the horizontal to the inclined axis of such openings should be that given in Rankine's 'Applied Mechanics', article 234; and for spherical domes the springing is taken at or about the angle of rupture, 51°-49'.

"Water is raised by an iron bucket and chains passing over a pulley and worked through one of the side openings, in preference to the leathern mót or churrus. These openings may be closed by trap doors with lock and key."

Conservancy.

The lines, both of the Infantry and of the Artillery, were, at the very frequent visits I paid them, clean. The latrines are well attended to, and no defects, except those of construction, were discovered; and it is evident that the most scrupulous care is taken to preserve cleanliness in every detail. The wastage water from bath-rooms, lavatories, &c., is received into iron receptacles and removed by puckalee bhistis, and used for watering trees in the neighbourhood. The water from the cook-houses also runs into iron receptacles, and is removed by puckalee bhistis to a distance, and is discharged generally into the nála close to the nightsoil trenches. The nightsoil from the European barracks is taken to trenches, which are, however, situated on a site which I consider is in dangerous proximity to the barracks, as they are only 600 yards distant from the hospital on the north-east.

The ground in which the trenches are dug, is outside Cantonment limits and on the north bank of the commencement of the Parade Nála which during the monsoon is said to be marshy. In the beginning of October I found it to be very wet. I am informed by residents that, whenever the wind blows from this quarter, the smell from these trenches is very perceptible from the road passing along the north side of the hospital, and that it is a nuisance. The dry refuse is deposited on the open plain above the Parade Nála to the east of the barracks, where it is collected in a very large heap. I regard this method of disposal as most objectionable and improper. The adoption of the poudrette system could be very easily carried out, and a site might be chosen which would be unobjectionable; I am certain for a small community in India it is, in the absence of a sewerage scheme, by far the most efficient way of disposal as regards health. Any way, the dry refuse should be daily burnt, and not stored to undergo slow decomposition.

The European cemetery, which has lately been enlarged, is on the east of the general parade ground. I visited it on the 4th October. I found the water level in an open grave about 4 feet below the surface, a burial had taken place 7 days previously in an adjoining grave, the smell emanating from which was so bad that it made me sick.

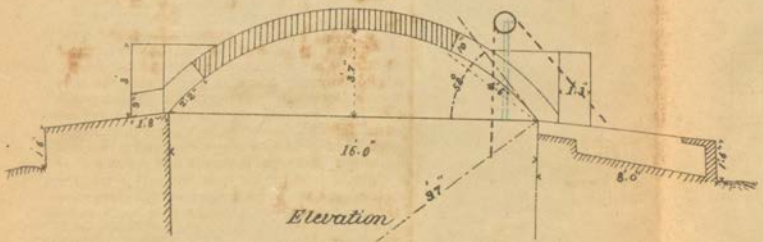
The necessity for draining this burial-ground has been pointed out by the Executive Engineer, but his estimate was not passed.

It is, in my opinion, a most urgent sanitary work, as during the monsoon the water level must be lowered before the prescribed depth of grave can be reached in dry soil.

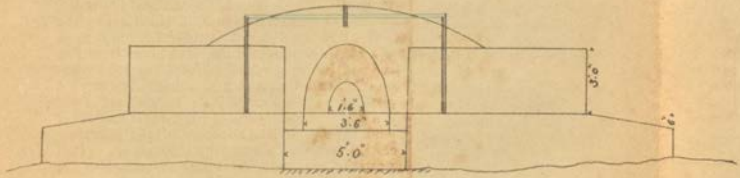
Vaulted Covering Proposed for Wells

Neemuch

Section



Elevation



Scale 4 feet to an inch

C R Gail C.E.

Executive Engineer Neemuch Dn

Govt Photozinco Office, Poona, 1883

COMMISSARIAT.

The meat has, except during the hot weather, been of fair quality. The station has great advantages as regards a good supply of vegetables being always obtainable, as there is a good Commissariat garden; but the troops do not, as a rule, derive as much benefit as they might if the orders of Government permitted it. The Commissariat Officer proposed to issue 4 ozs. of French beans and dil pussand instead of a similar quantity of potatoes or onions; but, as the men did not like the change, it was not carried out, and it must be remembered that the nutritive value of the vegetables proposed to be issued is far inferior to that of potatoes. It is, however, in my opinion, extremely desirable that a free ration of green vegetables—such as French beans, lettuces, green peas, or even bhâji—should be made in addition, however, and not in substitution of any part of the existing vegetable ration. It seems to me that this is really much needed, for I have noticed a congested spongy condition of the men's gums in this as well as in other stations, which though some medical officers attribute to malarial cachexia, I cannot but consider is an evidence of a scorbutic taint.

Vegetables of all kinds grow well at Neemuch, and the First Cavalry have a garden which financially pays and which supplies most excellent vegetables. Why should not the British troops have a similar garden, and grow green vegetables for themselves?

I made particular enquiries regarding the supply of milk to the men, and find that the battery is supplied by a contractor at the rate of 5 annas per man per mensem for those who wish to take milk.

The cows are brought to the lines and milked there. The owner lives at Kanauti and keeps his cows there. In the Detachment 2 milkmen have passes into barracks, and the cows are brought there and milked. These animals are under no sort of supervision, and there is too much reason to fear that their food and water is very far from what it ought to be.

The litter of the cavalry regiment and battery is sold to contractors, and I have reason to believe that it is used as fodder for cattle.

At the hospital the cows are milked in presence of a patient.

The bakery is situated in one of the old Infantry barracks, which has been converted for the purpose. Its defects are many, and have been pointed out by the Executive Commissariat Officer, but it has not been possible as yet to obtain sanction for a proper bakery. I regret to see that the two Stevens' dough-kneading machines are not used, as they are said to be broken. The machinery in them is so simple that, in my opinion, they can only have been broken by culpable carelessness: as their use entails labour in turning the wheel, I cannot help thinking that the Natives have broken them purposely. The consequence being that all the bread is hand-kneaded,—an operation which has only to be seen during the hot weather to be condemned.

I also visited the Commissariat slaughter-yard, which is situated on the north-east of the Sadar Bázár, and is about 2½ miles distant from the barracks.

It has an enclosed court-yard, and is paved for three-fourths of its area: at one end is the hanging shed with walls perforated by bottle openings. It is paved, and the carcases after skinning hang all night in it. The yard is flushed down with water brought by a bhisti. The blood, &c., runs off by a drain, and is received into a masonry tank outside, which is cleaned by a sweeper; whilst a cutcha drain has been constructed to carry off the storm water during the monsoon. The hides, bones and hoofs, &c., of cattle are the property of the contractor who provides the cattle for slaughter; the sheep are supplied by the Commissariat Department. The building is old and not up to the requirements of the present day; but its chief objection is that it is only 70 paces distant from the ground where the nightsoil of the Native Lines, Officers' houses and a portion of the Sadar Bázár is deposited in trenches, which, of course, emit a very offensive smell. I consider this slaughter-house is from this proximity most dangerously situated, as the meat must at times be exposed to a tainted atmosphere, and, in my opinion, steps should be taken at once either to remove the slaughter-house or to close the nightsoil pits.

If, as I am informed, there is a difficulty in finding a fresh site for the night-soil pits, although they are, in my opinion, too close to camp, I think that a pro-

perly constructed slaughter-house and hanging shed might be built at a place much nearer the barracks on the open plain, where there would not be any danger of atmospheric pollution.

Lock Hospital.

The Lock Hospital is situated in a building enclosed by a wall on an open space to the south of the Sadár Bázár. The following information is taken from the annual report of Surgeon Major O'Farrell. There are only 23 prostitutes on the register who are examined once a week, among whom 89 admissions took place during 1882 from the following diseases:—

Gonorrhœa.	Syphilis, Primary.	Syphilis, Secondary.	Bubo.	Excoriation.	Leucorrhœa.	Rheumatism, Syphilitic.	Ulceration of Os Uteris.	Other Diseases.	Total.
6	17	...	1	22	35	1	4	3	89

The average number of prostitutes in hospital during each month of the year was 4·8. The women are said to be fairly regular in their attendance at the weekly examination. During the year, 25 were reported to the Cantonment Magistrate for non-attendance; of these 5 had married, 16 absconded, and 5 were fined one rupee each.

The following table shows the amount of venereal disease among the troops during 1882:—

Corps.	Average Strength.	Number of Admissions from Venereal Disease.		Ratio per 1,000 of Strength.
B/2 R. A. and Detachment 1st Worcestershire Regiment	436	Syphilis, primary	37	84·86
		" secondary	17	38·99
		Gonorrhœa	30	68·80
		Orchitis, gonorrhœal ...	1	2·29
		Total ...	85	194·95

Of the above, 10 cases, equal to 422·93 per 1,000 of strength, were contracted at other stations; the remaining 75 cases, or 172·01 per 1,000 of strength, were admitted for disease contracted at Neemuch.

The following statement shows the ratio per cent. of the under-mentioned venereal diseases of the European and Native troops during 1882 as contrasted with 1881:—

Corps.	Ratio per Cent.		
	Syphilis, Primary.	Syphilis, Secondary.	Gonorrhœa.
B/2 R. A., 1881	.....	.....	.....
Do. 1882	4·82	1·62	3·25
Detachment 1st Worcestershire Regiment, 1881.	4·02	.....	3·02
Ditto ditto 1882.	9·90	4·79	8·30
1st Bombay Lancers, 1881	0·86	0·58	0·29
Ditto ditto, 1882	1·0	.....	.....

The higher ratio of venereal disease among the men of the Detachment may perhaps be due to the more idle life the Infantry soldier leads. The medical officer reports that the registration system is efficient as regards the Cantonment, but is powerless to prevent disease being contracted in neighbouring villages which are in Foreign territory. The Cantonment and Regimental Police are said to do their duty very well, but are apparently unable to prevent women from the many villages in the immediate vicinity of the Cantonment from

carrying on illicit prostitution. In my opinion, if the Act were made to apply to all prostitutes living within a radius of 4 miles of the Cantonment venereal disease would be much checked. The present half-measures are not only expensive, but are not calculated to prevent the ravages of the disease.

The total expenditure during the year amounted to Rs. 1,613-4-5, and the receipts on account of fines levied under the rules to Rs. 5.

Disease Statistics among European Troops.

I find from the returns which I have received from the Sanitary Commissioner with the Government of India that, after Baroda, Neemuch is the station under the Bombay Command in which British troops have suffered most severely from malarial fevers, and that cholera has caused a far higher mortality in it than in any other Cantonment. Enteric fever has also prevailed to a great extent, and the general health of European troops has always been greatly deteriorated by a residence in Neemuch.

The following figures refer to the 10 years ending 31st December 1881:—

Station.	Average Strength.	Admission Rate per 1,000 of Strength from all Fevers, excluding Enteric Fever.	Deaths in 10 years.				
			Cholera.	Enteric Fever.	Ague.	Remittent Fever.	Dysentery.
Neemuch	4,306	1,344·4	55	11	1	4	1

As these figures do not differentiate between the corps that have formed the garrison, I have compiled from forms which have been kindly furnished by the Secretary to the Surgeon General and from Station Sanitary Form B the following information, which shows the admissions and deaths among the men of the Battery and Detachment of European Infantry since 1865 as far as is available:—

Royal Artillery.

Year	Corps.	Average Strength.	Cholera.		Enteric Fever.		Intermittent Fever.		Remittent Fever.		All Fevers.		Diarrhœa.		Dysentery.		All Causes.		Ratio per 1,000 on average Strength.					
			A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	Cholera.		Enteric Fever.		All Fevers.		All Causes.	
																			A.	D.	A.	D.	A.	D.	A.	D.
1865	D/19 ...	134	3	3	...	...	...	...	77	...	81	...	15	...	5	...	326	6	22·4	22·4	...	...	624·9	...	2430·9	44·7
1866	F/19 ...	135	...	...	...	...	...	...	84	...	90	...	3	...	2	...	300	4	...	...	...	...	666·6	...	2074·1	29·6
1867	Do. ...	136	...	...	...	...	...	...	99	...	4	...	102	...	13	...	315	1	...	...	...	...	735·0	...	2500·0	2·3
1868	Do. ...	137	...	...	...	...	...	...	60	...	...	...	100	...	10	...	170	1	...	...	...	...	437·9	...	1240·7	...
1869	Do. ...	141	3	1	...	...	...	...	...	...	172	...	5	...	3	...	351	5	21·2	7·1	...	...	794·3	...	1631·0	35·5
1870	Do. ...	142	...	...	...	...	...	...	...	...	1	...	1	...	1	...	296	4	...	...	154	154	605·4	...	1940·5	27·0
1871	D/18 ...	147	...	...	2	1	...	...	89	...	3	...	9	...	2	...	292	2	...	...	20·4	6·8	672·6	...	1980·4	13·6
1872	Do. ...	150	2	...	1	2	...	...	3	...	21	...	3	...	2	...	298	2	13·3	...	6·6	...	540·0	...	1986·6	13·3
1873	Do. ...	151	...	...	...	...	...	...	8	...	12	...	4	...	2	...	296	6	...	...	...	...	264·9	...	1854·9	39·7
1874	Do. ...	122	...	...	1	...	...	...	...	...	92	...	3	...	4	...	315	3	...	...	7·9	...	754·0	...	1677·2	23·6
1875	F/9 R. A. ...	166	25	19	...	...	...	...	...	...	44	...	20	...	5	...	368	20	150·4	109·	...	...	265·0	...	2260·0	120·4
1876	E/4 Brigade R. A. ...	156	...	...	13	6	69	...	3	...	129	...	20	...	...	...	318	8	...	...	83·3	38·4	826·9	...	2038·5	51·2
1877	E/1 late E/4 R. A. ...	157	...	...	1	...	83	...	...	...	93	...	3	...	...	...	303	1	...	...	6·3	...	592·9	...	1929·9	...
1878	E/9 R. A. ...	148	1	...	...	...	113	...	2	...	317	...	37	...	11	...	418	9	6·7	...	...	...	2,141·9	...	2820·0	12·3
1879	G/2 R. A. ...	143	...	...	...	...	104	...	...	...	308	...	20	...	5	...	354	2	...	...	...	...	2,097·1	...	2738·1	13·9
1880	G/2 R. A. ...	143	...	...	...	...	97	...	...	...	305	...	15	...	5	...	354	2	...	...	...	...	2,097·1	...	2738·1	13·9
1881	G/2 R. A. ...	151	...	...	...	...	...	...	...	...	177	...	9	...	2	...	402	5	...	...	...	...	1,172·2	...	2662·2	33·1
1882	E/3 R. A. ...	160	1	1	...	...	...	...	2	...	358	...	13	...	1	...	435	2	6·2	6·2	6·2	...	2,237·5	...	2625·0	12·5

Detachment, European Infantry.

1865	No record ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1866	Detachment, 33rd Foot.	177	1	1	...	...	83	...	8	...	158	...	6	...	5	...	348	2	5·6	5·6	...	...	891·4	...	1,960·1	11·3
1867	No record. ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1868	Detachment, 56th Foot.	147	...	...	...	...	60	...	1	...	88	...	2	...	4	...	347	1	...	...	...	...	597·9	...	1,377·1	7·8
1869	Do. 2/1 do. ...	164	7	6	...	...	...	...	1	...	176	...	13	...	13	...	344	8	42·7	36·6	...	...	1,097·5	...	2,097·5	48·8
1870	Do. 1/8 do. ...	152	...	...	1	1	...	...	...	...	45	...	4	...	6	...	297	5	...	...	6·7	6·7	296·0	...	1,145·2	39·4
1871	Do. do. ...	226	...	...	4	3	...	...	10	...	231	...	12	...	8	...	429	3	...	...	17·6	8·8	1,059·2	...	1,879·4	13·1
1872	Do. 99th do. ...	204	26	21	4	...	...	...	4	...	277	...	4	...	2	...	370	22	80·2	64·8	12·3	...	855·3	...	1,142·5	67·9
1873	Do. do. ...	207	...	...	...	...	...	...	11	...	263	...	15	...	6	...	520	2	...	...	...	...	1,191·4	...	2,080·0	9·6
1874	Do. 108th Regt. ...	278	...	...	...	...	...	...	20	2	307	...	19	...	3	1	529	6	...	...	...	...	1,026·0	...	1,902·5	21·6
1875	Do. do. ...	278	3	3	...	...	...	...	40	...	373	...	21	...	8	...	490	5	10·7	7·1	...	...	1,341·0	...	1,842·8	17·9
1876	Do. 60th L. I. ...	266	...	...	1	1	146	...	24	...	398	...	18	...	4	...	466	2	...	...	3·7	...	1,496·2	...	1,750·1	7·5
1877	Do. do. ...	127	...	...	...	...	127	...	2	...	129	...	2	...	1	...	291	1	...	...	...	...	1,015·6	...	1,859·3	...
1878	Do. do. ...	286	16	14	...	...	286	...	32	2	369	...	112	...	3	...	710	31	37·1	50·0	...	...	1,289·8	...	2,535·7	79·9
1879	Do. 2/57th do. ...	268	...	...	1	1	160	...	5	...	175	...	41	7	7	...	1105	4	...	...	3·9	3·9	5,537·7	...	4,096·2	19·2
1880	Do. do. ...	272	...	...	2	...	413	...	1	...	419	...	17	...	5	...	730	2	...	...	7·3	...	1,681·9	...	2,691·1	7·4
1881	Do. 2nd Battalion Leicestershire.	250	...	...	...	...	312	...	...	...	344	...	12	...	5	...	670	...	...	...	...	...	1,328·0	...	2,320·7	...
1882	Do. 1st Worcestershire.	308	...	...	1	1	...	...	9	...	372	2	9	...	2	...	817	5	...	...	10·3	7·7	1,157·1	6·4	2,652·6	16·2

The information thus obtained does not, however, give what is so necessary to know, *viz.*, the monthly distribution of disease; and though such is readily obtainable from the forms introduced by the Sanitary Commissioner, yet as these only

extend back as far as 1876 I have thought it desirable to obtain, for as long a period as possible, a record of the deaths that have been caused by cholera in this station among all classes of Europeans, and the following tables are compiled from the death registers which were kindly lent me by the Chaplains. Table I shows the total number of the deaths from cholera amongst Europeans during the last 23 years. It will be observed that the disease has appeared in 10 of the above years, and in 6 of them with great severity. In 1865 no less than 47 deaths were caused by it. One officer—an Assistant Surgeon attached to the Royal Artillery—and 3 men of 18th Brigade Royal Artillery who at that time occupied the old Artillery barracks on the south of the present Cavalry Lines, and 38 men of the 45th Foot who were then located in the old Infantry barracks on the north of the Native Infantry pendalls, fell victims to the disease. The table shows that, every 3 or 4 years, cholera has appeared among the troops, and Mr. Lumsdaine's theory of the triennial intensity of its poison is borne out by the outbreaks in 1872, 75 and 78 :—

Table I—Cholera.

Year.	Officers.			Men.			Women.			Children.			Departments.								Civil.		Total.
	Cavalry.	Royal Artillery.	Infantry.	Cavalry.	Royal Artillery.	Infantry.	Cavalry.	Royal Artillery.	Infantry.	Cavalry.	Royal Artillery.	Infantry.	Ecclesiastical.	Ordnance.		Public Works.		Commissariat.					
														M.	F.	M.	F.	M.	F.	M.	F.	
1865	..	..	..	1	..	16	..	1	1	..	..	1	..	..	..	..	..	..	..	..	..	..	20
1867	..	..	..	..	..	2	13	..	1	..	..	..	4	..	..	..	..	..	..	..	..	..	20
1868	..	..	1	..	..	2	36	..	..	2	..	..	2	..	1	..	..	..	..	..	..	..	42
1869	..	..	..	..	..	1	6	..	1	1	..	1	1	..	..	..	..	..	..	1	..	..	12
1872	..	..	..	..	..	..	21	..	..	..	..	..	3	..	..	..	..	..	..	..	1	..	25
1875	..	..	..	..	..	17	2	..	..	1	..	3	..	1	..	..	..	..	..	..	..	..	24
1877	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	1	1	..	..	..	1	1	5
1878	..	..	..	..	..	15	..	..	1	..	..	1	..	..	..	1	1	..	..	..	1	1	21
1881	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1
1882	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1
Total	..	..	1	..	..	114	111	..	4	6	..	6	13	1	2	1	1	..	1	2	2		174

I have also compiled the following table showing the distribution of these deaths by months :—

Year.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Rainfall.
1860	..	..	..	..	..	..	..	11	9	..	..	..	20	Not available.
1862	..	..	..	..	..	..	..	14	6	..	..	..	20	51·4
1865	..	..	..	..	15	2	1	1	19	8	1	..	47	41·26
1869	..	..	..	..	1	1	..	7	3	..	..	..	12	32·51
1872	..	..	..	..	1	2	5	8	9	..	..	..	25	Not available.
1875	..	..	..	..	..	..	1	21	2	..	..	..	24	41·51
1877	..	..	..	..	..	..	..	..	..	..	3	..	3	17·36
1878	..	..	..	..	1	..	..	..	3	5	12	..	21	49·14
1881	..	..	..	..	..	..	..	..	..	1	..	..	1	36·72
1882	..	..	..	..	..	..	..	..	..	1	..	..	1	38·73
Totals	..	..	..	..	18	5	7	62	51	15	16	..	174	

No death from cholera has during the 23 years taken place during the 5 months—December, January, February, March and April ; but on the 4 occasions when it has appeared in the month of May it has attained its maximum intensity during the succeeding rains and autumn, although but few cases may have occurred in the month of June.

It will also be remarked that by far the most numerous deaths from this disease have taken place in August and September.

The return of rainfall supplied by the Staff Surgeon is not complete for the whole period ; but it will be observed, by a reference to the return previously given, that in 1865 the outbreak of cholera in May was preceded by an unusually heavy rainfall in April, when 13 inches were registered.

It will also be noticed that in those years in which the rainfall was above the mean (36·38 inches) the outbreak was usually severe. I think that it may be fairly inferred that in Neemuch, at all events, there is a connection between rainfall and cholera. Whether this is due to the soaking of the soil and the percolation of filth—whether specific or not—into the wells, or whether it is due to malarial poison, it is impossible to say authoritatively; but, in my opinion, it is not at all improbable that many of the deaths returned as cholera may really have been caused by algid pernicious intermittent fever.

I am certain the prevalence of cholera at this station is principally, if not solely, due to local causes, and I am confident that the liability to an outbreak would be immensely lessened by the execution of proper sanitary measures, such as drainage and the provision of a pure water-supply, which, however, is not only required in the Sadar Bázár, but also in the many villages in the close proximity of the Cantonment, and which as long as they are allowed to remain in their present filthy and neglected condition must always be a standing danger of the very greatest importance to the health of the British soldier in Neemuch.

Fevers.

By the returns it will be seen that there have been 37 admissions and 17 deaths from enteric fever from 1870 to 1882 among European troops at Neemuch. Of these cases, 22 admissions and 11 deaths took place among the Artillery, whilst there were 15 admissions with 6 deaths among the Detachment of Infantry; and as the aggregate average strength of the Artillery for the 13 years was 1,948 and that for the Infantry Detachment 3,564, the percentage of admissions was for the Artillery 1·13, whilst that for the Infantry was only 0·42. So that, it is evident, the men of the Artillery have suffered *pro rata* a great deal more than the Infantry.

It will also be remarked that the disease among the Artillery is principally confined to the first seven years of the period during which time the battery was quartered in the old barracks, which were situated to leeward of the Sadar Bázár. As before stated, the new barracks were first occupied in September 1876; and though cases occurred after the move, yet the disease originated in the old barracks. Since 1876—*i. e.*, since the battery has been located in the new barracks—there have been only 2 admissions from this disease among the Artillery.

No remarks by medical officers are available before the station sanitary forms were introduced in 1876; but in his report for that year the medical officer in charge of the E/4 Royal Artillery, which arrived in Bombay from England on the 16th March 1875 and at Neemuch on the 12th February 1876, says:—"There were 13 cases and 6 deaths from enteric fever; the disease was apparently due to the insanitary condition of an old latrine in the old barracks; the type of fever was typhomalarial."

Five of these admissions took place in August, 6 in September, and 2 in November. An admission from this disease took place in November in the Detachment of the 68th Light Infantry, and the medical officer in noticing it says: "One case of enteric fever occurred, the disease being prevalent in E/4 Royal Artillery at this station; the disease was contracted therefrom."

In February 1877 another case occurred in the same battery, the designation of which had been changed to E/2, in the person of a young recruit who had recently arrived from England, and who, the medical officer states, contracted the disease whilst the battery was encamped 3 miles from Cantonment for target practice. No remark is made about the fatal case in the Detachment 2/17th Regiment in 1879, which occurred in April in a young man 22 years of age.

Two cases of enteric fever occurred in the Detachment 2/17th Regiment in October 1880, but the medical officer was unable to assign any cause.

The ages of the 17 men who died were as follows:—

Years.	19	20	21	22	23	24	25	26	35	36	Total.
Number	1	4	1	4	1	1	1	1	1	2	17

so that 12 were young men under 25 years of age.

The length of total service of only 9 of the above men is recorded :—

Years of Service.	1	2	5	7	14	Total.
Number	2	3	1	2	1	9

and their Indian service was as follows :—

	Months.						Years.
	7	8	17	18	19	20	5
Number	1	1	2	1	2	1	1

So that 8 of these deaths took place in the first 2 years of residence in India.

The following table shows the monthly distribution of the admissions and deaths in each corps from enteric fever :—

Year.	Corps.	Average Strength.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.	
			A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
1870	R/14 K. R.	146	..	..	2	1	..	1	..	..	..	..	..	..	..	..	3	1	..	..	..	..	..	..	..	..	5	1
1871	D/15 „	147	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	1	..	..	..	..	..	..	..	3	1
1872	D/15 „	150	..	1	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	1	1
1873	D/15 „	151	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1874	D/15 „	157	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..
1875	F/9 „	161	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1876	E/4 „	156	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	6	2	3	2	1	..	..	..	15	4
1877	E/2 „ (late E/4)	155	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
1878	E/2 „	149	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
1879	G/2 „	148	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1880	G/2 „	147	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1881	G/2 „	151	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1882	E/2 „	180	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	..
	Total	1,945	..	1	3	1	..	1	..	..	..	..	..	..	..	..	13	1	7	2	..	2	1	..	..	..	29	11
1870	Dett. 106th R. C. Regt.	213	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1	..	..	..	..	1	1	1	1
1871	Dett. 106th do.	229	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1872	Dett. 106th do.	234	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..
1873	Dett. 106th do.	261	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1874	Dett. 106th do.	278	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1875	Dett. 106th do.	280	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	1
1876	Dett. 106th do.	268	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1877	Dett. 60th do.	264	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1878	Dett. 60th do.	264	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1879	Dett. 2/17th do.	259	..	..	..	..	..	..	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1
1880	Dett. 2/17th do.	259	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1881	W/8 2/17th do.	277	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	2	..
1882	Dett. 2nd Bat. Leicestershire Regiment	888	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
1882	Dett. 1st Bat. Worcestershire Regiment	803	..	..	..	..	..	..	..	..	..	..	1	1	2	..	2	1	..	..	..	..	..	..	..	..	5	1
	Total	6,504	1	..	..	..	..	..	1	1	..	..	1	1	2	..	2	1	4	1	2	..	1	1	1	1	15	5
	Grand Total ... { 5,319 Admissions / Deaths		1	..	3	1	..	1	1	1	..	..	1	1	2	..	15	2	11	3	2	2	2	1	1	1	37	16

It will be seen that, although isolated cases occurred during the winter and spring, the admissions during the months of greatest heat—April, May and June—were remarkably few, and that the chief incidence of the disease took place during the rains and autumn.

No record has unfortunately been kept of the number of the barracks from which men suffering from cholera, enteric fever or paroxysmal fevers have been admitted. Such over a long series of years would have given very useful information, and such, I think, should always be kept in every station by order.

The following return of the cases of enteric fever admitted into the Station Hospital in 1882, with remarks by the medical officer, is extremely interesting :—

Station Hospital, Neemuch.

Statement of Cases of Enteric Fever admitted into the above Hospital contracted by the men of B/2 Royal Artillery and the Detachment 1st Worcestershire Regiment.

Corps.	Regimental No.	Rank and Names.	Company.	Date of Admission.	Disease for which admitted.	Disease changed to. First occasion.	Disease changed to. Second occasion.	Date of Discharge.	Date of Death.	Age. Years.	Age. Months.	Total Service. Years.	Total Service. Months.	Service in India. Years.	Service in India. Months.	Ward occupied by Patient.	No. of Barrack in which the man formerly lived.	Habits	No. of previous attacks of Enteric Fever.	Remarks.
1st. Worcester Regiment.	2402	Private	Arthur Liddle	A	29 6 82	Ague	Remittent fever 24 7 82	Enteric fever 8 8 82	..	9 8 82	21	1	2	1	..	7	No. 2 Ward afterwards isolated.	8	Temperate	2	This man may have contracted the disease in the bazar, where he was in the habit of spending all his spare time. He was out shooting 2 days before admission.
Do.	976	Corporal	Thomas Sutton	A	13 7 82	Do.	Enteric fever 25 7 82	....	..	13 10 82	23	6	5	1	3	4	No. 3 Ward afterwards No. 4 Ward.	4	Do.	2	Disease may have been the result of contagion. He was a friend of Liddle's and frequently came to see the latter before he was isolated.
Do.	659	Private	John Baldwin	B	31 7 82	Remittent Fever.	Enteric fever 12 8 82	....	..	21 9 82	23	5	5	3	3	5	No. 3 Ward after No. 4 Ward.	3	Do.	2	Attributes disease to bad smell from stagnant water in the moat of the fort.
Do.	1975	Private	William Nash	A	3 8 82	Do.	Enteric fever 19 8 82	....	..	21 9 82	20	2	2	2	0	7	No. 3 Ward after No. 4 Ward.	3	Do.	0	No reason for the disease in this case can be traced.
Do.	2040	Private	Edwin Snelling	A	12 8 82	Enteric fever	Do.	....	7 10 82	25	1	4	0	3	5	No. 4 Ward.	4	Do.	5	Disease may have been contracted in the bazar. He was employed in the Telegraph Office, and spent a great deal of his time in the bazar.
R/2 Royal Artillery	1114	Gunner	James Gilbert	B/2	26 8 82	Ague	Enteric fever 2 9 82	....	7 10 82	20	0	1	11	1	4	No. 3 Ward after No. 4 Ward.	R. A. Bk. 2	Do.	1	Was in the habit of frequently going out shooting, and acknowledges that he often drank water in the Native villages.

It will be observed that, among the Infantry, Nos. 4 and 5 barracks each furnished 2 cases.

These barracks have before been reported as being more unhealthy than the others, and I think the cause is to be found in their being more exposed to malarial influences.

It will be also noticed that in the Artillery the only man attacked was 25 years of age, though there were 43 men in the battery under that age. In the Infantry a young man of 20 years of age, who had only been 7 months in the country, was attacked, but recovered. Another man 21 years of age, who had also only been 7 months in India, was attacked and died; whilst 2 men of 23 years of age, who had been in India upwards of 3 years, were attacked, and the remaining man was 25 years old. So that out of 176 men in the Detachment under 25 years of age 5 were attacked, one of whom died.

In my opinion, enteric fever at Neemuch is due to local as well as to climatic conditions.

The sanitary condition of the Sadar Bázár, and especially of the villages surrounding the Cantonment, is so bad as to render it extremely probable that the poison of true enteric fever is never absent from them, and is quite sufficient to account for an outbreak among those predisposed by youth and recent arrival to its attack. But I am also strongly of opinion that malaria must be admitted among one of the chief exciting causes of the so-called enteric fever, and the marked intensity of the disease during the rains and autumn convinces me that dampness of the soil and in the barracks must exert a most potential influence in its propagation.

The admissions from malarial fevers among the British troops as far as available is given in a former table; but as that does not show the monthly distribution, I have prepared from the sanitary reports the following table which embodies this information since 1876 :—

Year.	Corps.	Average Strength.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Remarks
1876..	R/8 R. A.	156	..	5	10	10	12	9	6	16	15	17	12	10	139	The returns of rainfall was kept at the Observatory at the European Barracks and not at the Field Hospital.
	Detachment 60th L. I.	208	6	8	23	33	37	11	29	55	53	43	19	22[5]		
	Rainfall	..	..	..	..	..	..	15·01	9·46	15·97	..	..	..	..	40·99	
1877..	R/8 R. A.	153	9	6	1	6	7	10	14	30	21	18	23	7	144	
	Detachment 60th L. I.	204	10	4	4	9	22	11	16	19	36	19	28	15	193	
	Rainfall	..	..	..	..	0·7	0·59	2·25	2·75	1·14	3·70	0·24	..	1·01	12·43	
1878..	R/8 R. A.	148	5	2	1	4	2	8	6	26	64	103	73	27	317	
	Detachment 60th L. I.	200	2	7	..	2	6	3	2	26	106	100	68	11	369	
	Rainfall	..	0·24	..	0·5	..	0·13	1·79	15·85	15·22	10·78	..	..	..	44·0	
1879..	G/3 R. A.	149	21	4	9	14	17	19	34	40	65	62	57	46	388	
	Detachment 2/17th Regt	259	30	23	27	51	66	55	61	66	129	105	100	72	620	
	Rainfall	..	0·6	0·40	..	..	..	2·25	2·08	11·7	4·87	0·47	..	..	21·13	
1880..	G/3 R. A.	142	36	10	13	25	21	17	11	11	21	26	26	18	257	
	Detachment 2/17th Regt	272	..	20	14	67	30	23	23	46	63	30	73	23	457	
	Rainfall	..	..	..	..	..	1·28	4·99	15·19	9·19	9·43	0·20	..	0·10	39·48	
1881..	Detachment 2nd Batn. Lancashire Regiment	259	36	2	7	11	25	12	12	16	31	102	20	43	344	
	Rainfall	..	..	0·09	0·18	..	0·48	3·72	13·67	10·61	2·62	..	..	0·97	31·18	
1882..	R/8 R. A.	160	..	..	5	11	13	8	11	23	59	51	86	50	317	
	Detachment 1st Worcestershire Regiment ..	306	3	9	8	24	21	35	29	35	89	105	148	75	583	
	Rainfall	..	0·4	0·14	..	..	1·6	4·22	21·16	5·58	6·76	0·16	..	0·09	41·01	

During some years there is an increase from fevers during the cold weather. This, I learn from the sanitary reports, is especially the case when the wind blows from the north-east, and the insanitary condition of the ground in that direction sufficiently accounts for their accession. The site where the nightsoil pits are situated, has already been described; but beyond it there is the filthy village of Kanouti, with a marshy tank and poppy fields, from which malaria must be generated. Fevers, however, are most rife, as might be expected, in August, September, October and November; and during these months the pallid, anæmic appearance of the men, Artillery as well as Infantry, denotes how saturated their systems must be with malaria. In my opinion the cause of the malaria is not difficult to arrive at.

The barracks have been built on what I consider perhaps the worst site in the whole Cantonment, although to an ordinary observer who visited the station during the cold weather it would, I have no doubt, appear exceptionally healthy, because the site is on, comparatively speaking, high ground, and is surrounded by open country; but when you come to consider it from a sanitary point of view there are very great objections to it.

In the first place the radical error has been committed, of placing them on the very confines of the Cantonment limits. The jurisdiction of the Officer Commanding ceases within a few hundred yards on the north and west sides; and in the case of Neemuch this error is aggravated, as the country beyond the limits belongs to a Native State where no sanitary measures can be enforced, and where every one of the many villages in the immediate neighbourhood of the Cantonment may be justly described as a centre of disease, especially the village of Bagána, just across the railway, which is filthy in the extreme, and which if it could be included in Cantonment limits would be a great advantage.

Then, again, it must be remembered that the country for miles from the south-west round to north is an area of depression consisting principally of black cotton soil, and this is nearly water-logged during the monsoon, so that when the rains cease, and the water-level begins to sink, the temperature being still high, malaria is generated, and the air passing over this extensive area at night becomes cold and chill, and is carried by the prevailing breeze straight into the barracks; whilst the sudden rise in range between day and night temperatures favours a recurrence of fever in those who have already suffered from a previous attack.

In the third place the very elevation of the site is a source of danger, as is well known "high grounds near exposed marshes are often more unhealthy than the places immediately adjoining which are on a level with them.—(Aitken)."

In the fourth place it has been found necessary, as Mr. Gael says, to keep up the water-level in the wells to dam the Leora Nála, not only at the tank near the barracks, but also at the Commissariat garden,—the consequence being that the water is ponded back in the sub-soil, which is kept damp instead of dry.

Fifthly, the barracks themselves are not water-tight, and the men live in rooms with damp walls.

Sixthly, local conditions in the immediate vicinity of the barracks favour the causation of disease, as the ground to the west, south and north of the barracks is more or less retentive of moisture, whilst that below the Leora Tank is distinctly malarious.

Finally, it must not be forgotten that the annual rainfall at Neemuch is, comparatively speaking, heavy and higher than either at Mhow or Nasirabad.

The Surgeon General in his report for 1881 says:—

"The station is well situated on an open tableland, the climate is reported healthy, drainage is good, water is plentiful and wholesome, the barracks and their accessory buildings are all that need be desired, and the most scrupulous care is taken to ensure cleanliness. Despite these favourable conditions, however, paroxysmal fevers of a mild kind, followed by anæmia and splenic affections, prevail amongst the troops at certain seasons to an excessive degree. The origin of this cause of sickness at Neemuch has, up to the present, remained an enigma."

But I think, when the conditions I have related are duly weighed, they will be found sufficient to account for the causation of the sickness, which renders the troops at Neemuch ineffective for a great part of the year.

Although no doubt, as pointed out by Mr. Lumsdaine, the individual imprudence of the men causes many admissions into hospital, and although the barracks are doubtless draughty during the monsoon, yet these conditions obtain in other stations where the admission rate from fever is not so high.

It is a much more difficult matter to suggest practical remedies which can be carried out. If money were no object, and if the surrounding country belonged to the British Government, then, indeed, it would be much simpler, and malarial fevers might become as rare as small-pox; but, looking at things as they are, I consider it is absolutely imperative, first, that the ground in front of the barracks and the race-course be provided with sub-soil drains according to the

principles laid down by Mr. Waring in his valuable work "Drainage for Profit and Health";—that is to say, that a pipe-drain be laid every 40 feet apart at a depth of 4 feet below the surface.

I consider the Leora Tank is a source of danger, for the reasons already given:

I cannot but think that it should be drained; but, if this is done, care must be taken to prevent the bed becoming a marsh. As, however, the tank is not entirely within Cantonment limits, and as draining it might interfere with the water-supply, it may be impossible to take this action, in which case I recommend that a thick wall of puddle be built in front of the dam to prevent leakage through it, although doubtless it would be much better to deepen the tank and confine its area by enclosing it with a thick masonry wall; but the cost would, I fear, be prohibitive.

I strongly recommend that the ground below it, extending down to the main nála, as well as the ground immediately in front of the barracks be sub-soil drained, and that all this tract and that along the northern face of camp be thickly planted with trees. The protecting influence of trees in intercepting malarial poison is well known, and I, therefore, strongly advise that the whole of the ground in front of the barracks down to the main nála be planted; but it must always be remembered that the planting of trees is not a substitute for sub-soil draining, which is the most effectual means that can be taken for aerating the soil and preventing the rise of moisture in it.

The measures I consider necessary to protect the barracks I have already spoken of, but there is one point that seems to me well worthy of a trial, at all events. Sir James Outram was, as far as I remember, the first to bring to notice the great safeguard afforded in a malarious country by the use of mosquito curtains in filtering the air breathed during the night. I can personally testify to their usefulness and, therefore, recommend that, to commence with, an experiment be made by supplying the men of one company, say of the Infantry and one barrack in the Artillery, with mosquito curtains for use during the rains and autumn. This suggestion may seem trivial; but when the men have suffered so much, any thing seems worthy of a trial. Fires should be kept burning in the barrack rooms during some portion of the day during the rains to dry the air, and, instead of the revolving fanlights over the doors, a window—hinged below and opening upwards as recommended by the Army Sanitary Commission—should be substituted so as to direct the current of air upwards and not downwards on to the men's cots.

I think the night duties, especially at the arsenal guard, predispose to malarial fever. I recommend that at night during the rains and autumn the sentry should be withdrawn from the gate of the Fort, which might be kept locked from sunset to sunrise, and that if it is absolutely necessary to have a sentry over the gate, arrangements be made for him to be stationed on the wall above it. The beat should be protected from rain. The ditch in front of the gate requires draining, as water is said to lodge there, and the ground all round the fort requires sub-soil drainage, and I advise that all men on night guard be provided with an extra ration of bread and coffee at midnight, and that all men should get a free ration of bread and coffee before going out in the morning. In an intensely malarial station like Neemuch this seems to me to be particularly needful. I am also of opinion that early morning parades should not be allowed, and that the men should not leave the barracks until the sun is up. I also think that more means of amusement should be provided for the men, such as a ball and tennis court, and that every endeavour be made to divert their minds from the depressing effect a heavy sick list always produces on the British soldier.

In my report as Acting Sanitary Commissioner for 1876 I recommended, as the European troops had suffered so severely at Neemuch, that, if possible, the station should be given up, or if it were absolutely necessary from a military point of view that they should be kept in this part of the country, that they should be located on the Upper Málwa plateau.

I believe it is an open secret that the Army Organisation Committee recommended that the European troops should be withdrawn from Neemuch; and I am sure this would be the best course to adopt, as I fear that it can never be made a healthy station for European troops without a very large expenditure

of money in the station itself, whilst the condition of the ground beyond the limits cannot be dealt with by the British Government ; but, if it is determined to keep them here, then I think they should be removed during the rains and autumn. If they could for these seasons be distributed between the Tárághar range of hills or Mount Abu, and only occupy this station during the cold and commencement of the hot weather, they would escape the period of greatest danger. If, however, they are retained in Neemuch all the year round, I can only advise that they be removed from the intensely malarious conditions they are now exposed to as soon as possible after the rains. It would not be a matter of much difficulty to construct moveable barracks which should take to pieces and be fitted with corrugated iron roofs, and such might be placed on the high ground on the Upper Málwa plateau, the first steppe of which is only 12 miles distant, where good water could be found, and which would not be so exposed to malaria as the present barracks are. Even if this cannot be done, the men could, at all events, as soon as the rains have ceased, be placed under canvas, or catcha barracks might be erected on the Jeerun plateau, where I believe they would suffer less than on the present site ; but it should be remembered that the barracks should face north-west and south-east, and that they should be built as far as possible from the low-lying ground on the south-west, so as to escape the full force of the south-west wind. The great thing, however, I am certain, is to remove the European troops from the sources of malaria, which year by year renders the Artillery as well as Infantry ineffective through sickness. The good effects of a march on the fever-stricken 98th at Karáchi taught in unmistakeable language the benefit to be derived from pursuing this course.

Women and Children.

The only record I can find about the admissions of the women and children is gathered from the sanitary reports, the details of which are given in the accompanying table. The same causes that affect the men operate equally against the women and children :—

Year.	Corps.	Average Strength.	Women.												Average Strength.	Children.									
			Cholera.		Enteric Fever.		Intermit. Remit Fever.		Remittent Fever.		All Fevers.		All Causes.			Cholera.		Enteric Fever.		Intermit. Remit Fever.		Remittent Fever.		All Fevers.		All Causes.	
			A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.		A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
1876 ...	E/4 R. A.	14	..	..	..	..	3	..	9	..	12	..	23	1	37	..	..	..	..	5	..	7	..	12	..	55	4
	Detd. 98th L. I.	13	..	..	..	..	5	..	2	..	7	..	16	..	17	..	..	..	..	3	..	1	..	4	..	13	..
1877 ...	E/2 R. A.	15	1	1	..	..	7	..	6	..	13	..	25	..	34	..	..	..	..	9	..	8	..	17	..	39	..
	Detd. 98th ...	10	..	..	..	..	6	..	2	..	8	..	9	..	10	..	..	..	..	3	..	2	..	5	..	10	..
1878 ...	E/2 R. A.	11	..	..	..	..	8	..	5	..	13	..	23	..	22	..	..	..	..	11	..	10	..	21	..	54	2
	Detd. 98th ...	9	..	..	..	..	5	..	2	..	7	..	12	..	6	..	..	..	..	4	..	3	..	7	..	13	2
1879 ...	G/2 R. A.	14	..	..	..	..	33	..	..	..	33	..	51	..	30	..	..	..	..	26	2	..	..	26	..	55	..
	Detd. 2/17th	10	..	..	..	..	36	..	1	..	39	..	70	..	18	..	..	..	..	26	2	1	..	27	..	60	4
1880 ...	G/2 R. A.	10	..	..	..	..	3	..	2	..	5	..	20	1	14	..	..	..	..	1	..	..	..	1	..	12	..
	Detd. 2/17th	12	..	..	..	..	19	..	6	..	25	..	35	..	16	..	..	..	..	4	..	4	..	8	..	8	1
1881 ...	Detd. 2nd Lancers	13	..	..	..	..	1	..	1	..	2	..	10	..	10	..	..	..	..	1	..	..	..	1	..	7	..

Native Troops.

The lines of the Native Cavalry Regiment, at present the 1st Bombay Lancers, are situated on the east of the Cantonment. They consist of 5 blocks of buildings, with a north and south aspect, on each side of a broad central street. The huts are of the usual description found in Cavalry regiments. Before each is an enclosed court-yard, in one corner of which is the latrine and bathing-place for the women and children. The huts are level with the ground, and are described as miserably small, being 11'6" long × 7'6" broad by 9' 6" high. The only ventilation besides the door is through the tiled roof.

The drinking water is derived from wells on the other side of the parade ground. The latrines, 2 in number, are situated about 400 yards to the south-east of the lines. The nightsoil is removed to the bázár trenches on the east. The utmost attention is paid by the regimental authorities to the surface cleanliness ; but in the troop lines the stale from the horses soaks into the ground, as there are no channels to catch it and convey it away to a distance.

The lines of the Native Infantry Regiment are situated in the centre of the Cantonment on the east of the axial ridge, and are of the usual design of Native Infantry lines. The rows of pendalls, which are of the sanctioned number, run north-west and south-east, and face north-east and south-west.

The huts are very defective, as they have no plinths, and the floor is considerably below the ground level, and the only ventilation is through the small door and tiled roof. There is no verandah. At the date of my inspection they were not occupied, except by the depôt of 17th Native Infantry. The usual defects of bathing places inside the huts were noticed.

The drinking water is derived from wells, of which there are 8 in the lines, besides others across the parade ground. The latrines of the faulty standard plan are situated, in my opinion, much too far off on the other side of the parade ground, about 600 yards from the men's quarters. These lines have, I believe, been condemned; and it is much to be wished that the very practical suggestion made by the special committee on line buildings for Native troops, *viz.*, of putting the single men in barracks, was carried out. This plan works admirably in Karáchi, where the Beluch Regiment occupy the old European Depôt lines, and I wish it were carried out throughout the Native Army. I believe a committee has lately recommended that both the Cavalry and Native Infantry lines at Neemuch should be entirely reconstructed, and I quite concur in the desirability of this proposal.

The following table regarding disease statistics among the Native troops is not as complete as I could wish, since the returns have been kept for some years regimentally and not by stations; it is, therefore, impossible to separate the number of admissions in this station.

In Neemuch, as in other stations, the savárs enjoy better health than the Infantry soldier, and the principal cause of admissions into hospital is due to malarious fever:—

Year.	Corps.	Average strength.	Cholera.		Enteric Fever.		Intermittent Fever.		Remittent Fever.		All Fevers.		Diarrhœa.		Dysentery.		All Causes.		Ratio per 1,000 of Average Strength.	
			A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	All Fevers.	All Causes.
1871	3rd Regiment, Native Light Cavalry	371	..	..	..	..	..	..	..	..	165	..	12	..	..	..	337	1	351·9	1,396·6
	22nd Regiment, Native Infantry	621	..	..	..	..	..	..	..	..	737	..	59	..	..	..	1,042	2	1,291·6	1,686·0
1872	22nd Regiment, Native Infantry	626	4	2	..	..	..	..	..	..	910	..	..	..	..	..	1,163	6	1,436·3	1,859·6
1873	22nd Regiment, Native Infantry	609	..	..	..	..	..	..	..	..	656	..	39	..	1	..	1,221	2	1,089·0	2,004·7
1874	3rd Regiment, Light Cavalry	302	..	..	..	..	..	..	..	..	279	1	1	..	5	..	511	3	910·6	1,692·0
	24th Regiment, Native Infantry	648	..	..	..	..	..	..	..	..	502	4	16	..	13	..	1,304	6	1,370·2	2,062·6
1875	24th Regiment, Native Infantry	622	..	..	..	..	..	..	..	..	536	..	44	1	15	3	1,035	11	942·1	1,864·0
1876	24th Regiment, Native Infantry (Neemuch and Delhi)	651	..	..	..	..	..	..	..	..	499	4	17	..	39	..	830	7	620·8	1,347·8
1877	3rd Q. Regiment, Light Cavalry	321	..	..	..	..	97	..	..	..	99	..	3	..	9	..	344	..	340·7	1,065·9
	Her Majesty's 10th Regiment, Native Infantry	604	1	..	..	..	478	..	13	..	680	..	15	..	7	..	1,155	1	1,172·5	1,912·7
	Her Majesty's Poona Horse	357	..	..	..	..	121	..	..	..	121	..	1	1	3	..	238	2	342·2	738·9
1878	3rd Q.'s O. Light Cavalry	318	..	..	..	..	449	..	..	..	449	..	2	..	10	..	691	1	1,420·0	2,187·7
	Her Majesty's 19th Regiment, Native Infantry	640	2	..	..	..	1567	1	..	..	1706	..	18	..	15	..	1,991	8	2,669·7	3,057·8
1879	3rd Bombay Lancers	312	..	..	..	..	297	..	..	..	299	..	2	..	2	..	302	2	743·6	1,150·8
	Her Majesty's 10th Regiment, Native Infantry	617	..	..	..	..	..	..	..	..	1200	7	14	1	11	1	1,444	10	1,369·5	2,340·0
1880	Her Majesty's 1st Bombay Lancers	320	..	..	..	..	85	..	..	..	84	..	..	..	5	..	106	1	321·9	778·8
	Her Majesty's 9th Regiment, Native Infantry	372	..	..	..	..	504	..	..	..	508	..	6	..	2	..	669	1	1,354·9	2,174·7
1881	Her Majesty's 1st Bombay Lancers	320	1	1	..	..	99	..	1	1	100	..	2	..	4	..	212	3	322·3	706·8
	Her Majesty's 6th Regiment, Native Infantry	658	..	..	..	..	627	..	..	..	640	..	9	..	3	..	880	4	979·5	1,341·5

I have thought it would be well to compare the admission rate between the European and Native soldiers from fever and all causes, and the following table shows this :—

Years.	European Troops.			Native Troops.		
	Average strength.	Ratio per 1,000.		Average Strength.	Ratio per 1,000.	
		All Fevers.	All Causes.		All Fevers.	All Causes.
1871	396	877·8	1,917·6	892	1,022·4	1,540·7
1872	474	607·6	1,261·6	638	1,426·3	1,823·9
1873	432	1,115·0	2,026·5	608	1,403·0	2,024·7
1874	405	1,207·4	1,955·5	948	1,227·8	1,977·8
1875	445	907·3	1,850·0	632	942·1	1,664·0
1876	424	995·3	1,846·7	651	628·3	1,247·3
1877	447	753·9	1,507·8	1,378	863·1	1,371·7
1878	426	1,650·0	2,768·7	964	2,335·5	2,765·6
1879	408	3,230·4	4,286·8	929	1,551·1	1,944·0
1880	414	1,727·0	2,838·1	611	962·3	1,628·5
1881	410	1,270·7	2,419·5	956	774·0	1,637·7

It will be seen that the Native soldiers, though living under much more unfavourable conditions as regards dwellings, food, clothing, &c., of late years have suffered much less than the European soldiers have done in their magnificent barracks.

I attribute a great deal of this exemption to the locality of the Native lines, especially of the Cavalry, which are in a much more sheltered position than the barracks, and to the absence of draughts in the huts. The same exemption is found among officers, who can regulate the amount of ventilation admitted into their houses, which are situated, for the most part, on the east of the Cantonment.

Sadar Bázár.

The Sadar Bázár is situated in the south-east angle and at the lowest end of the Cantonment, on ground sloping down to the Leora Nála on the south.

It covers an area of about 63 acres, and had at the census of 1872 a population of 11,787 persons. There were, therefore, only 187 persons to an acre, and each person had a mean area of 35 square yards, so that it was not at that time overcrowded.

The Cantonment Magistrate informs me that the figures of the census of 1881 are not available, and can only be obtained by employing a special clerk, so that I regret that it is impossible to show the present population by castes.

There are stated to be 2,085 houses in the bázár, of which 560 are of the better sort, 1,075 of an inferior description, whilst 450 are huts. The large majority of the houses are tiled, and 1,610 are said to have an upper story. The main streets, running south and north, are fairly wide, although in the back lanes the houses are much too close for thorough perflation. I learn from the Cantonment Magistrate's report that there are 120 privies inside houses and 22 in detached buildings. There are, besides, 2 sets of public trench latrines which are situated on the southern bank of the nála, and which afford accommodation for 40 males and 40 females. There are also 50 open cesspools constructed of concrete, and about 30 also made of concrete in which iron receptacles are placed. Permanently covered cesspools are not allowed. The scavenging establishment consists of 1 mukádam and 4 sweepers for cleaning roads and 4 sweepers for cleaning the 6 public urinals, the urine from which is removed in one of Broadley's patent iron hand-carts. The cleaning of the Sadar Bázár is carried out by private agency, although one cart and 2 sweepers are maintained by the Cantonment Committee to remove rubbish and to clean gutters. The conservancy establishment works under the supervision of a bázár serjeant assisted by

2 conservancy inspectors. The dry refuse from the Native Infantry lines and Sadar Bázár are deposited near the road leading to Old Neemuch.

The nightsoil establishment consists of 4 men, who are employed in digging trenches for the reception of the nightsoil from the lines of the Native troops and Sadar Bázár on ground on the north-east of the bázár, but only 70 paces from the Commissariat slaughter-yard, and 2 carts and 4 beldárs are employed in removing the nightsoil from the bangalows of European residents in the Cantonment and native public latrines, of which there are altogether 5 in the Cantonment. The nightsoil from the houses in the Sadar Bázár is carried away on buffaloes by private agency. There are no public markets. The beef, fish and mutton sellers live in bye-lanes near the bázár guard in the centre of the bázár. There are only three fruit and vegetable sellers who have shops; the remainder bring in their produce from the surrounding villages, and sit on the chubootra on either side of the main street.

The beef and mutton slaughter-yards are situated on the south side of the bázár across the Leora Nála near the Cantonment boundary limits. The public trench latrines are within 70 paces of them,—a most undesirable proximity. The average number of animals slaughtered daily are—

Sheep.	Goats.	Cattle.
10	4	4

No pigs are allowed to be slaughtered in the Cantonment. I am informed by the Cantonment Magistrate that the following animals are kept in the Sadar Bázár:—

Horses.	Ponies.	Buffaloes.	Calves.	Bullocks.	Goats.	Camels.	Sheep.	Asses.	Milch Buffaloes.	Cows.	Total.
6	25	40	100	150	200	211	225	230	397	468	2,052

The burial-grounds of the Mahomedans are outside Cantonment limits on the south. The Hindu cremation ghát is also on the south of the Cantonment. The Jews have a small burial-ground on the north-east, and the Pársi tower of silence is on the Jeerun plateau, about 2 miles from the station.

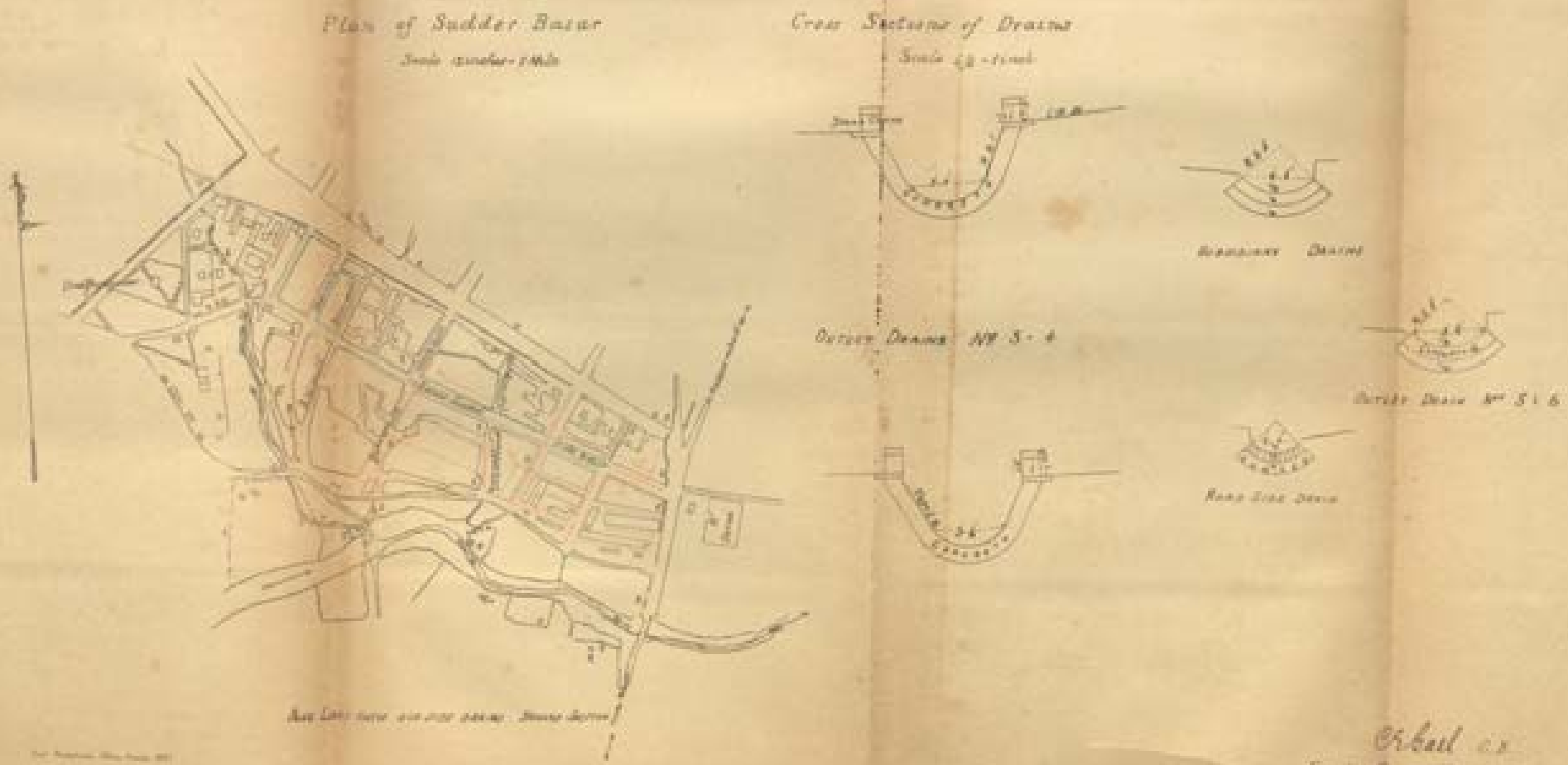
A great deal of excellent work has been done by the Executive Engineer, acting under the orders of the Cantonment Committee, in providing the Sadar Bázár with a system of paved open drains. The work is still in progress; but the following extract from Mr. Gael's report will be read with interest:—

"The site of the Sadar Bázár is a very favourable one for drainage, the fall available being quite sufficient. The storm waters are conveyed through the bázár into the nála by five principal main drains, viz., (1) that from the Pársis' quarters skirting the western boundary of the bázár; (2) from the drain passing under the bázár guard and traversing the mutton market; the others (3 and 4) situated in the Lucki Mandai and Passee Mohullas respectively; and (5) a channel formed by the side drains (on the bázár side) of portion of the Mhow and Neemuch road as it leaves the Cantonment.

"These channels, some of which continue a good way beyond bázár limits, also carry to the river the drainage water of a much larger area than that comprised within the above limits. In heavy storms they are insufficient, and the water rises, and finds its way over the surface to the nála in all directions."

Mr. Gael has constructed two large open saucer main drains of concrete, which will carry away all the refuse water and the storm water. No fœcal matter is admitted into these channels. The house connections are as yet incomplete, but, when completed, this drainage scheme cannot fail to be a great boon to the residents. The present outfall of the main drains is on to the bed of the nála. This is financially at present the only possible outfall; but it is dangerous, as many of the poorer inhabitants draw their water-supply from a well in the bed of the stream close to the outfall. Eventually, when funds permit, an intercepting sewer should, in my opinion, be made to carry during the

NEEMUCH DRAINAGE



fine weather all the refuse water to a point below the bridge on the Mhow road; during the monsoon it must go into the stream.

Births and deaths are, under the Cantonment regulations, reported within 24 hours of occurrence to the Police. A vaccinator is maintained by the Cantonment Committee who works under the orders of the Staff Surgeon.

Vaccination is performed once a week from arm to arm. The vaccinator learns from the register of births the number of children to be vaccinated, and the parents are informed by the Police that they should take the children to the Staff hospital.

The statistics of primary vaccinations and re-vaccinations will be learnt from the following table:—

Years.	Primary Vaccination.				Re-vaccination.			
	Number of Operations.	Successful.	Unsuccessful.	Doubtful.	Number of Operations.	Successful.	Unsuccessful.	Doubtful.
1872	179	153	20	6	27	23	4	...
1873	280	289	1	...	41	41	...	...
1874	191	177	14	...	49	49	...	...
1875	272	272	...	...	63	63	...	...
1876	304	304	...	...	...	...	...	...
1877	292	292	...	...	...	...	...	...
1878	317	316	1	...	...	...	...	...
1879	310	310	...	...	...	...	...	...
1880	342	342	...	...	101	101	...	...
1881	310	310	...	...	25	25	...	...
Total ...	2,797	2,755	36	6	306	302	4	...

The following table shows the number of births registered during 10 years ending 31st December 1881:—

Years.	Boys.	Girls.	Total.	Ratio per 1,000 of Population.
1872	146	114	260	22·0
1873	100	58	158	13·4
1874	65	38	103	9·1
1875	72	43	115	9·8
1876	91	66	157	13·4
1877	86	73	159	13·5
1878	68	75	143	12·1
1879	58	21	79	6·7
1880	110	86	196	16·6
1881	108	87	195	16·6
Total ...	904	661	1,565	

These figures show that the registration of births is most imperfect, and that only about half the real number are registered.

The next table shows the number of deaths arranged according to castes :—

Years.	Hindus.		Hindu Low Caste.		Mussalmáns.		Parsis.		All other.		Total.			Ratio per 1,000 of Population.
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.	
1872 ...	64	25	99	43	37	14	5	3	...	...	205	87	292	24·8
1873 ...	42	21	72	58	32	18	...	...	...	...	146	97	243	20·6
1874 ...	23	13	62	30	25	12	...	...	...	...	110	55	165	14·0
1875 ...	39	13	57	21	48	22	...	...	...	...	144	56	200	17·0
1876 ...	32	24	55	27	16	19	...	...	...	...	103	70	173	14·7
1877 ...	28	22	63	37	37	10	...	...	...	...	128	69	197	16·7
1878 ...	56	58	69	88	109	97	...	...	...	...	234	243	477	40·5
1879 ...	25	25	54	44	27	29	...	...	...	...	106	98	204	17·3
1880 ...	68	37	50	45	44	41	...	...	5	4	167	127	294	24·9
1881 ...	54	29	71	46	29	17	2	...	6	...	162	92	254	21·5
1882 ...	56	34	51	32	37	22	1	5	21	3	166	96	262	22·2

The deaths were due to the following causes :—

Years.	Cholera.		Small Pox.		Fever.		Bowel Complaints.		All other Causes.		Total.		
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	Total.
1872... ...	7	3	3	1	143	58	9	6	13	19	205	87	292
1873... ...	...	...	9	5	91	61	15	7	31	24	146	97	243
1874... ...	...	...	4	2	82	44	5	2	19	7	110	55	165
1875... ...	...	...	...	...	110	40	8	4	26	12	144	56	200
1876... ...	...	...	7	8	82	51	8	4	6	7	103	70	173
1877... ...	...	...	4	2	79	44	8	5	37	18	128	69	197
1878... ...	1	...	6	11	144	188	17	9	66	35	234	243	477
1879... ...	...	...	5	3	85	83	9	7	7	5	106	98	204
1880... ...	...	...	...	...	144	82	...	...	53	45	167	127	294
1881... ...	...	...	3	2	84	45	1	...	74	45	162	92	254
1882... ...	31	20	1	...	60	38	2	...	72	38	166	96	262

They are thus classified according to age :—

Years.	Boys.	Girls.	Adults.		Old People.		Total.		
			M.	F.	M.	F.	M.	F.	Total.
1872	70	21	91	38	44	28	205	87	292
1873	31	24	63	54	52	19	146	97	243
1874	34	23	52	18	24	14	110	55	165
1875	29	21	68	22	47	13	144	56	200
1876	29	25	46	26	28	19	103	70	173
1877	26	22	73	44	29	3	128	69	197
1878	74	37	112	178	48	28	234	243	477
1879	31	24	43	55	32	19	106	98	204
1880	63	62	66	38	38	27	167	127	294
1881	71	50	47	21	44	21	162	92	254
1882	64	44	46	25	56	27	166	96	262

The ratio of deaths among children to total deaths was as follows:—

Years.	Children.	Percentage on total Deaths.
1872	91	30·8
1873	55	22·6
1874	57	34·6
1875	50	25·0
1876	54	31·2
1877	48	24·4
1878	111	23·3
1879	55	26·9
1880	125	42·5
1881	121	47·6
1882	108	41·2

This last table alone is sufficient to show that the sanitary condition of the Sadar Bázár is not in a satisfactory state, the death-rate among children being the surest test of the sanitary condition of an inhabited area.

The deaths from cholera in the Sadar Bázár and among European and Native troops in the Cantonment will be seen from the following table:—

Year.	European Troops.	Native Troops.	Sadar Bázár.
1872	25	3	10
1875	24	...	...
1877	3	1	...
1878	21	2	1
1881	1	1	...
1882	1	...	51

I regret that I have been unable to obtain any very clear account such as should always be kept regarding the circumstances attending the first cases, &c., of the outbreak in 1882. From what I can learn, the disease appears to have originated amongst, and to have been principally confined to, the poorer classes, although I am informed it spread into the Pársi quarter.

It is greatly, in my opinion, due to the very energetic measures that were taken by the Officer Commanding to prevent the troops going into the Sadar Bázár that the disease did not spread to them. Another great safeguard to the troops in the Cantonment is that the main line of traffic passes outside and not through it, so that there is but little communication among the Native population between the barracks and the bázár.

The registration of deaths is for some years evidently most imperfect; and in drawing attention to this fact I hope steps will be taken to ensure greater accuracy. It will be noticed that in 1878, however, there were no less than 477 deaths recorded, which is equal to the very high ratio of 40·5 per 1,000. It was an unhealthy year, and 332 of these deaths were ascribed to fever.

The above brief description of the Sadar Bázár will show that there are several points which require action.

No town can be in a satisfactory state in which the removal of nightsoil and dry refuse is left to private agency. This is a radical error, and I would suggest that no time should be lost in imposing a conservancy tax and bringing the cleansing of the bázár under the direct management of the Cantonment Committee through its responsible officers. I cannot but think that its present state is a source of danger to the British soldiers frequenting it.

The public streets are defiled *passim* during the night in spite of the efforts of the police to prevent such a practice, but it is extremely difficult to find suitable places on the north side of the nála where public latrines could be erected; and yet, in my opinion, endeavours should be made to do so, as it is hard on the people to have to go across the stream to obey the calls of nature, especially during the monsoon, and they not unnaturally defile the ground near their own houses. If one or two of Colonel Goodfellow's latrines were erected, and the ashes of burnt town sweepings were placed in the receptacles, in my opinion such could be near the bázár without causing any offence.

I look upon the present method of disposal of the nightsoil and cutchra as most wasteful and insanitary, and strongly advise the introduction of the Násik system of making poudrette, and also of a much better system of native privy inside the houses. In this there should be a privy pan to hold every thing.

One of the greatest sanitary evils is the keeping such a large number of animals inside the bázár. Colonel Nuttall, the Commandant, is desirous of moving these animals outside bázár limits, where, if they could be accommodated in proper stables on suitable sites, it would be a great gain.

The necessity for a dispensary in the Sadar Bázár has been insisted upon by many Staff Surgeons, and it is a most urgent want. The Staff Hospital has for years past virtually taken the place of a Civil Hospital. It is not right to leave a town of 12,000 inhabitants almost without medical aid; and I would express my strongest opinion that a dispensary should be, as speedily as possible, provided.

Out of 12 of the bázár wells examined, 2 are pronounced of good and 5 of fair quality; whilst 5 are bad, some of which are very bad. Rambla Kullal's well contains as much as 415 grains of solid impurity per gallon. The soil is so porous that any liquid filth on its surface must percolate into the wells. I strongly advise most of the wells inside the bázár being built over, and closed, and that new wells, constructed according to the directions of the Army Sanitary Commission, be sunk on the outskirts of the bázár. In the meantime I think that the people should be at once prevented from using the well in the bed of the nála, as the filth brought down by the drain must percolate into it; but, of course, another well should be specially selected for the use of the low-caste people.

I also strongly advise the Railway Authorities to erect a dome, after Mr. Gael's pattern, over the well in front of the station. This well contains good water; but copious vegetable debris were found under the microscope, and this is not to be wondered at, as the well is so close to the road and open.

In concluding this report I must express my acknowledgments to Colonel Nuttall, Surgeon Major O'Farrell, Major Dalrymple, and the other officers who have given me information; and my especial thanks are due to Mr. Gael, the Executive Engineer, to whom I am greatly indebted, not only for plans, but also for the very valuable information I have embodied in this report.

T. G. HEWLETT,
Deputy Surgeon General.

REPORT ON THE CANTONMENT OF MHOW.

The Cantonment of Mhow, situated in latitude 22° 33′ 13″ north and longitude 75° 48′ 20″ east, at an elevation of about 2,000 feet above the level of the sea, is in railway communication with all parts of India, as the G. I. P. Railway at a distance of 353 miles from Bombay and 73 miles from Mhow passes Khandwa, the terminal station of the Málwa line, which is continued as far north as Ajmere, where it meets the Rájputána line connecting with the B. B. & C. I. Railway at Ahmedabad on the south and on the north with the main trunk lines at Delhi and Agra.

Indore, the Capital of His Highness the Máhárája Holkar, to whom all the surrounding territory belongs, is 15 miles distant from the Cantonment, which stands on the southern extremity of the Málwa plateau, for the most part on elevated ground, at a distance of from 3 to 4 miles from the Vindya Mountains, which passing from the west to east approach it on the south. These hills form the line of water-parting of the Narbada and Chumbul, and the drainage from their northern slopes renders the valley on the south-west, south, and east of the station marshy and water-logged during the monsoon.

The geological formation consists of moorum formed by the disintegration of the subjacent trap; but in parts, where the process is still further advanced, black cotton soil is found. The moorum, which varies in depth from 1 to 20 feet, is the water-bearing stratum, and in it wells have been sunk, many of which, however, run dry during the hot weather.

The highest part of the Cantonment is on the south-east, where there is a plateau on which the European Infantry barracks are situated. This has an abrupt fall on the south and east, but a more gradual descent on the west, where it forms a fine open plain used as the general parade ground.

The camp north of the plateau is divided into two ridges, of which the western is much the larger.

The eastern ridge falls abruptly on both east and west. On it the Royal Horse Artillery lines are situated, and further north are the Royal Artillery patcherries, the old cemetery, the Presbyterian church, the Staff and Lock Hospitals and Commissariat lines, until it ends in comparatively low ground towards the railway station.

The Station Hospital occupies the summit of the hill on the commencement of the western ridge. North of it, but on the eastern slope, are the barracks, &c., of the Heavy Battery, and still further north the Court-house, Government gardens and officers' lines, the church, and below it the Sadar Bázár; whilst on the extreme north, but sheltered by the ridge, are the lines of 2 Native Infantry regiments. On the western face, but at a lower elevation than the Station Hospital hill, by which it is commanded, is the Fort over the junction of the Neemuch and Bombay roads, the station library, and further north the Cavalry barracks and troop lines from which the ground falls rapidly towards the west and north.

It will be seen from the map showing the contour levels that there are great facilities for the ready escape of storm water, which is carried off by various surface nálás which from the plateau and the eastern ridge are discharged on the south-west, south and east into the valley, and thus contribute towards forming the head-waters of the Satia River.

One of the main nálás of the Cantonment is that between the eastern and western ridge, which commences below the plateau, and on its gathering ground are wells 35A and 35 which supply the Royal Horse Artillery barracks and the Station Hospital. It runs in the valley between these buildings and further down between the patcherries and the Heavy Battery, receiving in its course the

drainage from the compounds on the east side of the Mall, from the garden ground near the Post Office, and the Government gardens and Court-house. It then passes through the Sadar Bázár, where it is augmented by the drainage of several small nálás and of the large one which conveys the storm water from the eastern side of the elevated ground on which the Cavalry barracks stand. The main nála passes between Khitmagar and Mokery mohullas on the west and Luniapura and Gokul Gunj on the east, and after a very winding course joins the Satia River opposite Jethmall's garden above the village of Kisunpura. Another water-course starting from the pitch of the hill near the church takes a north-easterly direction past theNative Infantry lines, until it falls into the Satia River above the level crossing near Kisunpura.

The Gumbir River, fed by the stormwater from the high ground to the west of the Cantonment, extends along its front, receiving the drainage from all that part of camp which forms its western slope. The surface near the banks of this river is much cut up by small ravines through which the nálas discharge their contents into it,—whilst the low-lying ground between it and the Fort and Cavalry barracks and further to the north, where the race-course is situated, consists of black cotton soil, which after heavy rain becomes very marshy and in parts nearly water-logged. The slope of the hill below the new Cavalry barracks has been partly planted with trees, but the soldiers' gardens formerly established in this locality seem to have fallen into disuse.

The two rivers eventually join near the village Kawti, about a mile and a half to the north-west of camp. During the fair season temporary dams are erected at intervals across their beds so as to retain water in them, and there is an area of cultivated ground along the banks of each, that near the Satia River on the east being much the most extensive.

The area occupied by the Cantonment is stated to cover 6 square miles. The boundaries are not, from a sanitary point of view, what are desirable, as they exclude several native villages which are, in my opinion, a source of danger to the troops, and the sanitary condition of which has led to correspondence with the Darbár.

Starting from the south the boundary commences from a nála on the south side of the soldiers' garden in the valley below the European Infantry barracks, from the nearest of which it is 800 yards distant, and runs towards the east. It passes on the west of the tank and village of Kodria, the nearest patcherry being about 300 yards of the tank.

The line then proceeds in an easterly direction between the camel lines and Gowlipura as far as the compound of the Railway Engineer's bangalow, from which it proceeds towards the north-east and crosses the railway. Unfortunately it was not carried straight down to the Satia River, so as to have included the filthy village of Gujiakhera, which is situated on its bank, but on the east of the line which strikes the river immediately on the north of the village. The river as far as the village of Kisunpura, which is on the right bank and, therefore, outside the Cantonment, forms the boundary as far north as Kumbharwádá, a hamlet near the railway and the high road to Indore, where the line leaves the river and stretches along the north until opposite the race-course, whence it takes a westerly direction down to the river Gumbir opposite the village of old Mhow. From this point the Gumbir forms the boundary as far as the south side of the village of Gowlipura, which is within camp limits; but on its left or west bank are situated several hamlets which, as they are directly to windward of the Cavalry barracks, are a source of danger and nuisance. The line then runs in a south-easterly direction past the very filthy village of Ganglia Khera, which being in foreign territory is under no sort of supervision. It is then continued through the centre of the band-stand on the general parade ground until it joins the point from which we started on the south side of the European Infantry soldiers' garden.

Climate.

The climate at Mhow is said, on the whole, to be healthy, and not marked by any great extremes.

The following table, taken from the meteorology of the Bombay Presidency by Mr. Chambers, shows the monthly and annual mean temperature and the range between the greatest and least monthly mean :—

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual Mean.	Range between greatest and least monthly mean.
66°·3	71°·3	77°·7	83°·1	86°·9	79°·7	77°·1	75°·7	76°·2	77°·0	71°·3	67°·9	76°·0	20°·6

The temperature at Mhow is not so high as at Neemuch or Nasirabad between March and November, nor does it fall in the winter as low as in those stations; but the weather during the latter season is said to be cool and pleasant, whilst the heat during the summer is not excessive.

The numbers of occurrences of winds from each of the principal directions, including calms, and the total number of observations in each month are shown in the next table as given by Mr. Chambers :—

Directions.	N.	N. N. E.	N.E.	E. N. E.	E.	E. S. E.	S. E.	S. S. E.	S.	S. S. W.	S. W.	W. S. W.	W	W. N. W.	N. W.	N. N. W.	Total.
January	19	..	111	..	51	..	55	..	12	..	40	..	45	..	9	..	372
February	18	..	69	..	46	..	114	..	11	..	39	..	13	..	15	..	340
March	16	..	41	..	21	..	85	..	43	..	115	..	37	..	15	..	373
April	8	..	6	..	10	..	26	..	59	..	102	..	57	..	47	..	360
May	..	..	7	1	34	..	18	..	61	..	86	..	83	..	81	..	374
June	..	..	66	..	..	..	55	..	69	..	123	..	91	..	22	..	360
July	..	3	24	..	6	..	17	..	47	..	176	..	81	..	9	..	372
August	13	..	3	..	..	..	6	..	4	..	160	..	186	..	77	..	370
September	9	..	15	..	3	..	7	..	1	..	177	..	192	..	26	..	700
October ..	29	..	22	..	36	..	32	..	16	..	134	..	104	..	51	..	372
November ..	..	..	84	..	74	..	168	..	1	..	26	..	1	..	4	..	360
December ..	1	..	84	..	81	..	124	..	10	..	39	..	2	..	2	..	340

Westerly winds prevail from March to October and easterly from November to February, but there is a considerable southerly direction during every month except January.

The full force of the monsoon is felt in July, when also there is the highest rainfall, as will be seen by the following table, which shows the average monthly and annual rainfall at Mhow :—

January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Annual average.	Average of Monsoon Months, June to October.	Period of observations.
0·13	0·26	0·29	0·13	0·22	5·09	9·25	7·56	7·11	1·18	0·22	...	31·21	28·74	1863-70

On the average rain falls in every month except December, and the monsoon commences in June and lasts till October, whilst the annual fall on the average is 31·31 inches.

European Garrison.

The European troops quartered in Mhow in September 1882 were the 17th Lancers, who arrived in India from South Africa on the 28th October 1879 and at Mhow on the 1st November; the A Battery, 4th Brigade Royal Artillery, which arrived in India on the 22nd February 1874 and at Mhow on the 12th February 1882 from service in Afghanistan; the 5th Battery 1st Brigade North Irish Division, which arrived in India on the 19th December 1875 and at Mhow on the 16th November 1880; and the Head-Quarters of the 2nd Battalion the Lancashire Fusiliers, which arrived in India from England on the 18th October and at Mhow on the 22nd October 1881.

The ages of the men in each corps on the 1st July 1882 were as follows :—

Corps.	Years of Age.																	
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Above 30.	Total.
17th Lancers	...	...	4	4	4	8	25	29	18	60	43	42	47	21	31	94	427
A/4 R. A.	...	...	1	1	2	6	7	4	8	22	20	23	24	4	8	17	147
5/1 N. I., D. R. A.... ...	...	...	...	2	7	4	5	1	8	5	7	10	12	13	8	31	113
Lancashire Fusiliers... ...	5	1	6	5	27	92	108	99	64	67	60	52	32	16	7	43	684

and the total service in each corps is shown in the next table :—

Corps.	Total Service in Years.																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Total
17th Lancers ...	3	19	55	42	63	96	15	16	24	22	34	11	5	7	7	2	1	2	1	1	...	...	...	1	427
A/4 R. A. ...	6	28	31	23	8	4	6	25	3	4	2	5	...	2	...	...	...	...	...	...	...	...	...	...	147
5/1 N. I., D.R.A....	7	10	2	11	9	6	10	13	7	5	24	2	...	3	2	...	...	...	...	2	...	...	...	...	113
Lancashire Fusiliers	38	135	174	126	38	40	24	23	20	19	16	5	3	4	7	10	...	2	5	...	...	...	...	...	684

The length of service in India being as follows .—

Corps.	Service in India.											Total.	Remarks.
	Under 6 months.	Over 6 months and under one year.	One year and under 2.	2 and under 3.	3 and under 4.	4 and under 5.	5 and under 6.	6 and under 7.	7 and under 8.	8 and under 9.	9 and under 10.	Above 10.		
17th Lancers	...	34	4	289	...	...	...	...	...	...	...	...	427	23 men previously served in India
A/4 R. A. ...	14	6	...	25	52	17	7	6	8	5	29	8	147	9 do. do.
5/1 N. I., D. R. A. ...	...	19	...	5	13	16	2	8	29	8	1	2	113	3 do. do.
Lancashire Fusiliers...	...	121	563	...	...	...	...	...	...	...	...	...	684	76 do. do.

European Barracks.

The European Infantry barracks, now occupied by the Lancashire Fusiliers, 684 strong, stand on the confines of camp on the extreme left and on the most elevated ground in it, the hill on which they are built being about 80 feet above the Gumbir River.

They are 5 in number. Three of them, built in 1862, stand in line on the crest of the hill, and face the west. They are on the ground floor constructed of stone, but the upper story consists of brick, which is plastered over, and they stand on a solid plinth, which varies in height according to the slope of the ground, but which at the lowest end is about 2 feet above the ground.

On the ground floor the outer verandahs, 10 feet broad, are approached through thirty arched openings ; the arches, 16 feet high, extend along the front and rear of each barrack. The inner verandah, 12 feet broad, runs in front and rear of each of the two blocks into which the building is divided, and which are separated from each other in the centre by 2 stone staircases supported by iron girders which lead to the upper story. In each block are two dormitories opening into each other. Each room is 72 feet long by 23½ feet broad and 18 feet high, and is intended for 18 men, so that in the 4 rooms on the ground floor 72 men can be accommodated ; besides the above, at the outer end of each block, is a room 51′ long by 16′ broad extending across the building from each outer verandah, and adjoining it at either end of the barrack are 4 small rooms, each 12′ by 8′, divided by a central passage 26 feet long and 11½ feet broad. The rooms on the ground floor are paved with trap stone. There are no extraction shafts in them, and ventilation is effected through the doors, of which there are 5 on each side of the room opposite each other, which open into the inner ver-

andah. There are also revolving fanlights over the doors. Besides the 2 staircases in the centre of the building there are wooden ones placed at either end of the outer verandah on the east side which communicate with the upper story, which consists of 4 rooms of the same dimensions as regards floor space as those on the ground floor, but are 9" higher. The roof, which consists of corrugated iron, is planked on the inside, and the air escapes through a ventilating opening in the ridge over the centre of each dormitory. There are also clerestory windows over the doors.

The upper story is paved with trap stone : it does not extend over the end rooms on the ground floor, but there is a verandah, 11½' broad, in front and rear of the dormitories, and there are outside terraces which form the roofs of the outer verandahs on the lower story, the outer edge of which has lately been protected by iron railings. In the east verandah of each block, both on the upper and lower story, is placed a Macnamara filter; but the floor round it was in each case damp, and in some instances wet. Night urinal tubs are not now placed in the verandahs on the upper story. The men are supposed to go down to the urinal outside, but, as a matter of fact, they micturate through the iron railings.

A space of about 15 feet separates the blocks of barracks. In rear of each barrack is a latrine where dry earth is provided, but which was not in all cases used by the men at the time of my visit (September 6th, 1882). There is also a urinal with 4 compartments which was clean.

Behind each barrack is a cook-house, which has at either end an ablution room, the wall of which has been provided with a pipe fitted with brass cocks, the water being supplied from a raised cistern outside. The cook-room in the centre presents the dead wall of its chimney towards the barracks, and is approached from the east. The wall on that side consists of open brick work, a bad form of construction, as the ledges are used as receptacles for all kinds of matters—pipes, dirty rags, &c., &c.

The gymnasium is formed on the ground floor of No. 2 barrack.

The Staff Serjeants' quarters are in rear of each barrack, which completely shuts out the westerly breeze from them. The privy, cook-room and ablution room are in a separate building from the quarter, but under one roof, which appears to me a highly objectionable arrangement. The refuse water from all the cook and ablution rooms is carried through a chunamed gutter to the brow of the hill, where it escapes on to the ground.

The quarter guard stands in front of No. 1 barrack. It consists of a room 103' × 24', but this is divided into a guard room and lock up. It is surrounded by a 10-feet verandah. On its right rear flank are the urinals and bath rooms, adjoining which, but facing west, are the regimental cells, 10 in number. In rear of these is the latrine with 6 seats. This privy is about 60 yards from the end of No. 1 barrack, and is directly to windward of it.

Nos. 4 and 5 barracks are situated about 250 yards on the south-west front of the 3 barracks already described. They stand in echelon, No. 4 being on the extreme left of camp. It consists of an upper-storied building, and is built of stone on the lower story, but of brick on the upper. The plinth is of various heights, owing to the ground sloping away on the north and south. Its construction differs from that of the 3 barracks already described, as there are 4 blocks in each barrack, with a passage between each separating it from the adjoining room.

A verandah, 12 feet broad, extends around the ground floor, which was originally intended solely for recreation, dining and Serjeants' rooms, and not for dormitories.

The recreation rooms on the north side are now used by the Quarter Master as store rooms, but the 3 remaining rooms on the ground floor are used as dormitories. Each room so occupied is 73½' long by 23½' broad, and is provided with 5 planked doors having over each a revolving fanlight. Beside these means of ventilation are extraction shafts under the ceiling, which consists of brick arches laid in cement between iron girders supporting the upper story. The

arches in the verandah are provided with wooden sunshades, but the rain beats in, the consequence being that the stone flooring is after rain very wet. A Macnamara filter tub is kept in the verandah in the passage between each room, but the floor round each tub was wet from leakage. The upper floor is approached from the front verandah by two iron staircases which are placed in the passages between the two end rooms, whilst stone staircases lead from the verandah below to the upper story from either end of the barrack. The upper floor is divided, like the lower, into 4 rooms, each of which is intended to accommodate 18 men, and is provided, besides the doors and windows, with clerestory windows. The ceilings are planked, and the roofs are covered with corrugated iron, and provided with continuous ridge ventilators. On the upper story the arches of the verandah on the south-west are not only provided with wooden sunshades, but have also louvred venetians across the openings, which in the centre are made to slide so as to open and shut. These, however, only come down to the parapet wall, which extends across the arches for a height of about 4 feet from the floor of the verandah, and in this there are openings through which the rain beats. The men also complain that the roofs leak to such a degree that they get wet in their beds during heavy rain.

No. 5 barrack is of similar construction, but only 2 of the 4 rooms on the ground floor are used as dormitories—the remainder being utilized for the orderly room and other offices. The ground in front of No. 4 barrack has a sharp fall to the south and south-west, but a more gradual one to the west. It forms the general parade ground, but at a distance of about three quarters of a mile from the barracks it slopes rapidly down towards the filthy village of Ganglia Khera, and on the south-western slope there is an unwholesome tank which dries up after the rains. The surface of the parade ground was found to retain water in places for some days after heavy rain. I am informed that, since the erection of these barracks in 1872 and 1873, it has been noticed that men occupying them have suffered abnormally from fever, and in 1881 steps were taken to try and improve matters by fixing the louvres I have described across the arches in the south-west verandahs of the upper story, and by cutting surface drains along the ground in front, so as to prevent the lodgment of water, whilst 4 rows of trees were planted along the edge of the valley.

The canteen in rear of these barracks appears to be suitable in every respect. The married quarters are on the south-east of the barracks on the slope of the hill. They are 8 in number, but 1 is occupied by single men and only 2 by the women and children belonging to the Lancashire Fusiliers. In 3 of the remainder were the women and children, and in 2 the men belonging to the depôt of the 61st Regiment. The majority of the women and children living in these quarters have suffered from fever. There are drains leading from the cook-rooms and bath-rooms of these patcherries, but they end in an open earth trench, which was full of all kinds of filth on more than one occasion when I visited these quarters.

The native village of Kodria is about 600 yards away from the patcherries in the south, outside Cantonment limits, and between it and them was formerly a very unwholesome tank which was the subject of complaint; it was in consequence partially drained, but large pools of water still exist, and the bed of the old tank is covered with growing rice. Some cutchra, evidently brought from the barracks, was found above the tank. The huts of native followers attached to the regiment are situated on the slope of the hill, and are kept clean and well supervised.

The drinking water for the European Infantry is obtained from two covered wells, numbered 41 and 42, which are situated below the hill on the south. The plunge-bath also is on the low-lying ground.

The Artillery Barracks in Mhow, inspected 7th September.

The Royal Horse Artillery barracks are at present (September 1882) occupied by a field battery, *viz.*, A/4 Royal Artillery with a strength of 148 non-commissioned officers and men. These are new buildings, having been erected in 1878 and 1879, and are of exceptionally good design. In fact, in my opinion, if they had been built on raised basements, with an air space of at least 3 or 4 feet

beneath them, they would have been as perfect as it is possible to construct *permanent* barracks.

The site on which they stand, was formerly occupied by the patcherries; but these buildings faced north and south, whilst the barracks face east and west, so that only a portion of them is over a previously inhabited site.

On the south-west the ground on which they stand adjoins the plateau occupied by the European Infantry, from which it slopes towards the north, and there is sufficient space for all the subsidiary buildings, including the stables, &c., before the fall on the east, north and west becomes rapid. In front of the barracks on the west the slope is very decided, leading down to the nála before described, which receives the storm water falling on the north side of the plateau above and from the west side of these barracks as well as from the rising ground on the other side on which the Station Hospital is situated.

The barracks, 2 in number, stand in line, are constructed of stone, and consist of a single story. The plinth varies in height according to the level of the ground, but on the south end it is at a considerably higher level than on the north. Owing to the inequality of the ground each barrack has been built in 5 segments corresponding to the size of each room, and this necessitates steps between each room. A 12-feet verandah extends on either side of each barrack, the arches of which on the west are protected by sunshades. The pillars between the arches are 7 feet high to the spring of the arch, and the space across from one pillar to the next is 10 feet. Each barrack is divided into 5 rooms. At either end is a dormitory, 71'-6" long by 24' broad and 20' high. These rooms have 5 doors on each side, with a revolving fanlight and a glass shutter above each door, over which is also a clerestory window. The ceilings are planked, and have openings communicating with the external air through a ridge ventilator which extends along the length of the corrugated iron roof of each segment. The end rooms are intended to accommodate 18 men. The adjoining dormitories are, respectively, 60' long by 24' broad. They have 4 doors on each side, leading into the verandah, and the same arrangements as above described. They are intended for 16 men. The remaining room in the centre of the building is 44' long, and is designed for and used as a dining room. The roof consists of corrugated iron, and round the eaves is a large gutter which carries the storm water falling on it through iron pipes to a stone gutter running all round the building, whence it is carried away by a drain leading to the nála flowing to the east. A Macnamara filter is placed in the rear verandah. The floors of the verandah and barrack rooms are paved with trap stone, and the roofs are water-tight during heavy rain, and no leakage takes place.

At either end of each barrack is a quarter for a Serjeant which consists of 2 rooms and a bath-room. The front room is 16' square and the bed-room 16' x 9', the bath-room being 8' square. Each of these quarters has a verandah in front and on the side.

These barracks are somewhat sheltered from the full force of the south-west wind by the plateau on the higher level. This is a great advantage during the drying up of the marshy land after the monsoon.

On the flank of each barrack in the rear is the latrine, where dry earth is used. These places at each inspection were perfectly clean; though, in my opinion, the roof requires much freer ventilation than it now has. In the same line are the cook-room and urinals which were very clean and well attended to.

The Staff Serjeants' quarters (2) are on the north of the barracks. They are convenient and suitable buildings in every respect.

The barracks are about 50 yards apart, and standing in rear, and opposite the space between them, is a block of buildings used for the various offices, store rooms, &c. The quarter guard, which contains a lock up, is on the north of the lines, and is a suitable building. All the storm water is carried off by drains which discharge into a nála on the east.

The saddle rooms, forge, canteen, &c., are also in rear of the barracks, as are the stables which stand on the edge of the ridge towards the east where the

ground slopes rapidly down. At some distance below is the hay-stack, and below it are the sweepers' huts which are kept clean.

The married quarters belonging to the Artillery are at some distance from the barracks and lower down the ridge on the north. They consist of 4 blocks of buildings, each containing quarters for 10 families. They are numbered, respectively, from 5 to 8. No. 5 is occupied by the Royal Artillery Staff. No. 6 by 5 married men belonging to the A/4. No. 7 by the families of the Heavy Battery, and No. 8 by the Ordnance Department. Two of the blocks are new and 2 old. In the new blocks each quarter consists of a front room 14′×16 and 14′ high. The back room is 14′×10½′. These rooms are ventilated by doors and windows. A 12-feet verandah extends along the front and rear, but in the rear a portion of this has been converted into bath-room, 7′×6′. The subsidiary buildings are in the rear, and are suitable.

The native followers, syces, grass-cutters, &c., live in grass huts which adjoin those occupied by the bhistis and followers of the Heavy Battery, which are situated about 200 yards in rear of the married quarters. These huts are wretched places, and their floors after heavy rain are very damp; the ground from them slopes down to the south to a nála, which divides them from the tiled chall where the enlisted men of the Heavy Battery reside. For the accommodation of the native followers an iron latrine has been erected on the slope of the hill below the Artillery hay-stack which is above well No. 32. The native followers, however, draw their water from well No. 24, near the Commissariat lines, where the Artillery horses are watered.

The drinking water for the men of A/4 is procured from covered well No. 35 A, which is situated in the valley to the west of the barracks. It is said to run dry during the hot weather, when the men use the water from well No. 24: this, as it is immediately below the Commissariat cattle ground and stables, must be open to suspicion.

The men of the A/4 use a plunge-bath which is also used by the men of the Heavy Battery, and which is situated below and to the N. W. of the barracks.

The Heavy Battery, inspected 8th and 9th September.

The Europeans of the 5/1 North Irish Division (120 Europeans and 245 Natives) occupy the old Artillery barracks built in 1833. These are situated in a hollow, and are quite sheltered on the south and west by the Station Hospital Hill and Mall. The gun sheds are built on the higher ground along the side of the Mall, from which there is a public road passing between the barracks down to the Post Office, &c. The quarter guard is a bomb-proof building standing in front of the barracks, and consists of one room which is not well ventilated.

The barracks consist of 2 blocks standing in line, and separated from each other by about 28 feet, the width of the road. They are of a bad form of construction, as they consist of bomb-proof single-storied buildings of the following design:—each building has on the west side an outer verandah, 6 feet broad, which leads to an inner verandah 10 feet broad, in which there are doors opening into 2 rooms, each 78′ long by 24′ broad and 18′ high, which adjoin and open into two other rooms of similar dimensions alongside of the above, on the outer side of which is an inner verandah 10′ broad and an outer verandah 6′ broad, so that air in its passage from one side of the barrack to the other has to pass through no less than 7 openings.

The Serjeants' quarters are at each end, and consist of a room at the end of the inner verandah, 18′-9″×18′, and a room in the outer verandah, 14′×5′.

Attempts have been made, of late years, to improve the ventilation of the inner verandahs by piercing the roof and inserting a round tin ventilator, which is protected by a cowl during the monsoon; of these there are 3 on either side. The bomb-proof roof of each room has also been pierced, and a shaft let in which is carried up to the corrugated iron roof, which has been raised, and extends along the centre of each room—ventilating openings being made along the walls supporting the corrugated iron roof on either side.

The rooms at either end, which were formerly part of the Serjeants' quarters, have been demolished, so as to give access to the external air at each end, but these measures are necessarily insufficient; and a close smell, evidently owing to organic matter, was perceived each time on entering the barrack, which must tell prejudicially on the health of the men. During the hot weather these barracks retain so much heat that the men are unable to sleep in them, and consequently tents are pitched outside for them.

On the flank of each barrack in the rear is the latrine, which is also a bomb-proof building which was clean at each time I inspected it, but to which a persistent odour clings from want of proper ventilation.

The cook-rooms and urinals are also very old, and though kept clean are not good buildings. The canteen is on the hill, and not a good building. The wastage water from all the subsidiary buildings is carried through open chunamed gutters to the nála.

The Staff Serjeants' quarters, 2 in number, are situated on either side of the road, and the recreation room is on the slope of the hill below it, and close to well No. 28, from which the drinking water is drawn. This well is covered, and is 185 feet below the latrine on the right and 143 feet from that attached to the Serjeant-Major's quarters and 160 feet from the stables. All these buildings are on a higher level. The water in the well is, after heavy rain, within 3 feet of the surface of the ground; the well is said to be about 48 feet deep, but runs dry occasionally during the hot weather. The elephant and bullock stables are at the bottom, and are drained into the nála alongside.

In my opinion these barracks should be condemned: the site is not a good one, as it is in a hollow shut in on the west, and the buildings can never be brought up to the standard of the present day. If they are to be retained I advise, if the walls will stand it, that the outer verandahs be removed, and that the doors of the inner verandahs be much enlarged. I also think the partition walls in the inner verandahs should be removed, and a clear air space made all round the building.

The Cavalry Barracks, Mhow, inspected 15th and 16th September.

Occupied by 17th Lancers.

The Cavalry barracks are situated on the north-west of the Cantonment. They are at considerable lower level than the Infantry barracks, but the site they occupy is still well raised above the plain, and the ground on the east falls very rapidly down to the Sadar Bázár, which is about 600 yards distant from them. The Mall, church and officers' compounds are between the barracks and bázár.

On the west the ground falls rapidly to the parade ground on the further side of which the Gumbir River flows from south-west to north. Its course is somewhat winding, but the nearest bend is about 800 yards from the barracks.

The hamlet of Pensionpura, inside Cantonment limits, is within 600 yards of the nearest barrack; and unfortunately there are other villages outside camp in much nearer proximity to the barracks than is desirable, such as Kumbharwádá on the Neemuch road, Gowlipura, and the filthy village of old Mhow which is about a mile from the barracks on the north-west.

The surface drainage from the lines is carried off by 2 nálás. One drains the compounds on the west side of the Mall, passing between the high ground on which the old Cavalry (now the Auxiliary Station) Hospital and the Telegraph Office stand and the hill on which the barracks are situated. It passes down between wells 14 and 15 and under the road, and then flows across the parade ground to the river. The other nála is further north, and drains the lines and stables, and is discharged into the river near the Neemuch road.

The ground between the hill on which the barracks stand and the river is water-logged during the rains, and the rising ground extending for some considerable distance on the west on the other side of the river is in places and over large areas at that season marshy, as it is undrained.

The barracks consist of 5 upper-storied buildings. Barracks Nos. 1 and 2 were erected in 1866, and stand in line on the ridge, though further north and,

consequently, at a lower level than the married quarters and hospital. Nos. 3, 4 and 5 were built in 1872 and 1873, and stand on the side of the hill in echelon to the south-west front of Nos. 1 and 2 barrack, the furthest corner of No. 3 being 400 yards from the south-west end of No. 2 barrack. Nos. 1 and 2 barracks are of the same pattern as Nos. 1, 2, 3 barracks in the European Infantry lines, which were erected, it will be remembered, in 1862. These barracks are in line, and are separated from each other by a space of 20 yards. They face east and west. On the south and west side the rain falling on the roof is conveyed through iron pipes on to a stone gutter, but on the north and east it falls through iron spouts from the roof of the verandah on to the ground, to be absorbed as best it can.

The rock on which the barracks stand, consists of porous moorum deepening into rock. The barracks are built of stone on the lower story, but of brick on the upper. The height of the plinth varies according to the slope of the ground. On the ground floor the outer verandah, 10 feet broad, is approached through arched openings (13'-2" high to the top of the arch) of which there are 30 on the east and west, the extreme length of the barracks being 438 feet. These arched openings are not provided with sunshades. The outer verandah extends all round the building, and leads to an inner verandah 11'-3" broad, from which in the centre of the building are two stone staircases leading to the upper story, whilst opposite either end of the inner verandahs on the east are wooden staircases also leading to the upper story.

On the ground floor are 2 dormitories, each 71'-9" long by 23' broad and 18' high. Each accommodates 18 men. The inner verandah on the east side is used as saddle rooms and that on the west as a dining room. Each dormitory is ventilated through 5 doors on either side, over each of which is a revolving fanlight. The ground floor is paved with stone. At the end of each dormitory is a long room, 51'×16', opening into the outer verandah; on the south side this is used as a library; on the north the room is at present empty. At each end of the barrack, and next to the long room, are 4 small rooms, each 18'×12'. Two such adjoin each other on the east side, the remaining 2 being on the west; a central passage, 26'×11', divides these rooms. Those on the south side are used as Serjeant's quarters, and on the north are the orderly room and offices. All these rooms are provided with a clerestory window 11 inches broad. The upper story does not extend over the end rooms. It consists of two dormitories on either side of the central staircases; each dormitory is 71'-9"×23' and 19'-8" to the tie beam of the roof, which is planked on the inside, whilst the outside is covered with corrugated iron. Over the centre of each room is a ridge ventilator 10 feet long. There are clerestory windows under the eaves over each door, but they are fixed, and do not open.

The ventilation is effected through the doors and windows opening into the verandah, which is 11'-3" broad. The roof over the the outer verandahs below is terraced, and the outer edge has lately been protected by an iron railing let into brick pillars, so that the men can safely sleep outside during the hot season.

The upper floors are paved. A urinal tub is kept at night in the east terrace. The place round it is protected by an iron railing—an arrangement which was found necessary before the outer iron railings were erected. The floor of the terrace is cemented, and where the urine tub stands was wet, and smelt offensively. A Macnamara filter tub is kept in the verandahs both on the upper and lower stories, and the floors below it were wet, and in some cases the tub leaked.

No. 2 barrack is of exactly a similar construction. The ground floor on the north side is occupied by the gymnasium and the theatre, and on the south by the band.

In the rear of each barrack on the east is a latrine where dry earth is used, and the urinals which were quite clean at the time of my visit. These urinals are insufficiently ventilated, and the ground appears to be saturated, for a persistent ammoniacal odour was noticed in each. In my opinion, the urinals should be removed, and a building provided, which should consist of a roof supported by wooden uprights; between each of which bamboo

battens for a height of 4 feet from the ground should be fixed. In this way a clear air space would be provided between the battens on the 4 sides and the roof, and proper ventilation would be secured.

The urine tubs were as clean as it is possible to keep them.

The cook-house with the ablution room at either end was fairly clean. There is no wall on the east side, which is a decided advantage; but the cook-room chimneys are not sufficiently large, as there was much smoke in the room. The water used in cooking is kept in a wooden barrel on a stand outside.

The Staff Serjeant's quarters, consisting of 4 blocks, each containing 3 quarters, stand in line in rear of these barracks, which shut off the westerly breeze from them. The cook-rooms and privies are built in rear of each quarter. The privy, being under the same roof as the cook-room, is objectionable.

The canteen is built on the space opposite the openings between the two barracks.

The refuse water from the bath and cook-rooms of the Serjeant's quarters, cook-rooms and from the men's ablution rooms and cook-houses is conveyed through a chunam gutter to a reservoir about 75 yards in rear of each barrack, which has been constructed at the top of the soldiers' garden, where during the hot weather it is utilized over the garden, but during the rains is carried away by carts.

The married quarters consist of 2 blocks facing west, in line with the Serjeant's mess and Nos. 2 and 1 barracks.

Each block has in front a verandah 12' broad, and each quarter consists of 2 rooms, the front being 19½' × 12', and the rear one 12' × 10', whilst in the rear verandah is a bath-room 6' × 10' from which the bath water is conveyed to a gutter running along each side of the blocks, and which discharges into the road-side drain. The buildings stand on a low plinth; the roofs are tiled, and provided with a ventilator over each quarter.

The cook-rooms are in rear, the dry refuse is thrown into a box, and the liquid refuse has to be carried to iron receptacles placed at intervals along the line.

There are 2 latrines in rear of the line of cook-rooms, one for men and the other for women.

The new Cavalry barracks are numbered, respectively, 3, 4 and 5. They stand in echelon, and face the south-west. The end of No. 5 is opposite No. 1 barrack and 225 yards from it, and the remaining 2 are opposite the married quarters, and at the same distance. They stand on the water-shed of the Gumbir River and on a considerably lower level than the barracks already described, and most unfortunately have been built on ground formerly occupied by a Native Infantry regiment.

These barracks, erected in 1871 and 1872, consist of 2 stories, and are built of stone. Each building contains 3 blocks, each block being connected with the one adjoining by a passage. Being built on sloping ground, the height of the plinth varies considerably. In No. 3 barrack it is on the north 1'-1" high, on the east 4'-5". Around each barrack is a verandah 12' broad on the west. The outer wall is arched, the arches being protected by sunshades. Only one room is temporarily occupied by 7 men on the ground floor, the remainder being used as a mess-room, the master-tailor's workshop and store, the shoemaker's room, Quarter Master's stores, &c., &c.

The upper story is approached from the west by iron staircases from the verandah, whilst outside at either end of the building are stone staircases leading to the upper story, and there are also 3 stone staircases leading from the projections in the east verandah which are placed opposite the Serjeant's quarters between each of the blocks.

The upper story consists of 3 rooms separated from each other by a passage 17' wide. Each room is 72' × 23'-6" × 19'-9" high to the tie beam.

The floors are paved with stone. The roof is planked, and covered with corrugated iron, and has continuous ridge ventilation. There is also a louvred opening in the gable end of each room. Ventilation is also effected through the doors, of which there are 5 placed opposite each other at either end of each room, over each of which is a revolving fanlight, the arches being provided with windows. There are also clerestory windows above, which admit light, but not air, as they do not open. The Serjeant's quarters, 2 in number, are placed on either side of the centre block. They are approached from the passage between the 2 dormitories, and consist of 2 rooms, the front one being 17'-9" × 13'-3" and the bed-room 17'-9" × 9'-8", and a bath-room 7'-11" × 7'-10". Windows are provided, so that the Serjeant can see into each of the men's dormitories.

The bath-room water passes through an iron pipe attached to the external wall on the east, and falls into a chunamed cesspit below, from which it is removed by carts. The water from the bath-room of the Serjeant's quarters on the lower story is also discharged into this cesspit. This arrangement is, I think, very objectionable. A room, 7'-9" square, was especially constructed close to the head of the stone staircase at each end of the building in which it was intended that a night urinal tub should be kept; and to carry off the water used in washing the floor an iron pipe was led into one of the iron downtakes for storm water, but this practice was stopped, as it conveyed an unhealthy smell to the dormitories, and the tubs are not now kept inside, but just outside the end rooms, which are now utilized by the men as places to keep their boots in during the rains, where they are dried round a siggri.

The upper verandahs have sunshades across the arches, and are protected by a parapet wall 4 feet high, which has arched openings varying in number from 3 to 6 according to the size of the arch. The rain beats in through these arches both above and below the parapet wall. The roofs above are cemented, but they leak. Macnamara filter tubs are placed in each verandah, but the pavement round was wet.

On the south-west of the barrack and at a lower level is the cook-room, which has been made in an old bomb-proof building. It was insufficiently ventilated, and not clean. The liquid refuse flows through a chunamed drain into a reservoir at the head of a garden, where it is utilized during the fair season, but during the rains is removed by carts.

Immediately to windward of this cook-room is a bomb-proof building used as a privy by the family of the master-tailor. It requires much freer ventilation.

The urinals and men's latrines are in rear of the barracks, and are kept clean.

Barracks Nos. 4 and 5 are exactly similar in details of construction; 9 men occupy the ground floor of No. 4 barrack, but all the other rooms in it are used as offices for keeping stores. In No. 5 barrack all the men sleep on the upper story, the ground floor being used as a school-room, store-rooms, &c. The latrines and urinals attached to the buildings were clean.

The recreation room for total abstainers is on the north of No. 5 barrack, and the plunge-bath is about 180 yards in front of No. 5 barrack.

The drinking water for the regiment is at present drawn from well No. 14. The well is about 250 yards to the west of No. 3 barrack and about 75 yards from the plunge-bath, but it is only 40 yards from the lower road, which is much used, and it is near the nâla which receives the surface drainage of the ground above.

The ball court and ration shed stand about midway between Nos. 2 and 5 barracks.

The standard guard room and cells (6 in number) are about 70 yards in front of barrack Nos. 1 and 2. It consists of a day room and a lock up for Native prisoners. The building has a very low plinth of about 1 foot, and the floors, which are paved, appear damp.

There are clerestory windows round the guard room, but the only other ventilation is through the doors. The guard consists of a serjeant, corporal, a trumpeter, and 9 men by day and 12 men by night.

The roof water is discharged through pipes on to the ground, to be absorbed as best it can.

The Provost Serjeant's quarters are at the north end of the main building.

The cells face west, and are not sufficiently protected against the rain. This necessitates the outer planked door being kept shut, which makes the cell very hot. Each cell has a cubage of 2,080 feet and a superficial area of 130 feet. It would be better if the outer verandah was protected against the rain by jhamps. The privies and ablution rooms are in the rear. It is here necessary to state that experimental holes were dug on 1st September, after heavy rain, to see the state of the sub-soil water; care was taken to prevent surface water or rain getting into them. One hole was dug on the north-east side of No. 1 barrack and on the south-west of No. 3 and north-west of No. 5 barrack. In all, water was met at a depth of about 1½ feet, and this on being baled out speedily filled again, so that the men could not dig deeper until it was removed.

The ground floors of all the barracks were found more or less damp, especially in the mess room of No. 3 barrack, which presented the appearance of having been recently washed down, although it had not been for a week previously. This damp appearance is supposed by some to be caused by the men spilling their salt; but the whole floor space was damp, and not only that portion near the tables.

The stables are on the north of, and very close to, No. 1 barrack. These are 6 in number. Two of them are covered with corrugated iron roofs, but the remaining are bomb-proof buildings. The stale of the horses sinks into the floor, and the smell of ammonia is very pungent and penetrating.

The syce and grass cutters' lines are about 400 yards to the north-west of barrack No. 1 and about 220 yards to the north of No. 5 barrack. These persons are hutted in tiled challs, there being about 10 ranges of huts. There are 72 syces and 125 grass cutters, including women and children; a latrine has been erected for their use, and the lines are kept as clean as circumstances permit.

The horses are watered at a trough at well No. 9 at the foot of the hill; the depth to the water is at present about 30 feet. At the head of the troop lines is a building which is used by the regimental dhobis, who are not allowed to take the clothing into the bázár to dry or iron after they have washed it in the river.

The Station Hospital.

The Station Hospital is established in the building formerly known as the European Infantry Hospital; but as the accommodation in it is not sufficient for the requirements of all the British troops in Mhow, the Cavalry Hospital is used as an auxiliary hospital, where some of the men and all the women and children are treated.

The Station Hospital occupies a commanding position just below the plateau on which the Infantry barracks are situated; the ground slopes gradually on the west, but rapidly towards the east and also on the north, where it adjoins the lines occupied by the Heavy Battery.

It consists of an upper-storied building, which is of nearly the same design as the European Infantry barracks. It is built of stone below, but the upper part consists of brick plastered over.

It stands on a low plinth about 2 feet high, and extends for 375 feet north and south, and faces east and west.

An arcaded verandah, 10′ broad, provided with sunshades between the 23 arches extends on the east and west sides of the building. This is approached by stone steps, and leads into an inner verandah, also 10′ broad, which on the west side is used as a dining room.

The building is divided into two wings by a stone staircase in the centre.

At the south end there is on the east a ward for the treatment of prisoners, which is 17′ long × 16′ × 17′ high, which accommodates 2 men, and a small room

which is used for the storage of medicines, &c. On the west side there is an inspection room at present occupied by the Medical Officer, 1st District, as a laboratory, and adjoining it is the dispensary, which has been enlarged on the north by a portion of the inner verandah in front of the end main ward having been taken in.

In each wing there are 2 wards communicating with each other through an arched doorway, which are, respectively, 64′ long × 24′ broad and 17′ high; each ward accommodates 13 patients, so that each bed has 118 square feet and 2,009 cubic feet. Ventilation is effected through openings passing through the inner and outer verandahs on either side. There are revolving fanlights over the doors, and there is also a door leading to a central passage between the dispensary and the prisoners' room at the south end. A wooden staircase leading to the upper story has been erected on the east of the inner verandah opposite the end of the ward. The centre wards in each wing are 64½′ long, 24′ broad and 17′ high, and they respectively accommodate 14 patients; each bed has 113 square feet and 1,931 cubic feet.

On the north end on the ground floor the 4 rooms are used as offices, admission room, senior medical officer's room, and waiting room. All the wards on the ground floor are paved with trap stone. A stone staircase supported on iron girders leads from the inner verandah to the east side of the upper floor. The space under the staircase is used as a purveyor's store room.

On the upper floor the inner verandah and wards are paved with stone, but the terraces over the outer verandahs are cemented.

A roof, consisting of corrugated iron and planked inside, extends as a lean to from the wall supporting the roof of the main ward over the outer verandah on the north, west and south, and from the roof of the end wards on either side on the east, but there is no roof over the outer verandah on the east side opposite the 4 main wards. This roof is supported by brick pillars with a parapet wall about 4 feet high, with openings below it. Over the end rooms on the ground floor, and divided by a central passage flagged with sandstone, are 2 small wards, each 31½′ long × 17½′ broad × 15½′ high, with 4 beds, so that each bed has 138 square feet and 2,136 cubic feet.

The floor of these rooms is asphalted; the ventilation is effected through 2 windows in the external wall, and by 2 doors. The ceiling is planked, and covered by a corrugated iron roof. No. 12 ward, or that in the south-east corner, is coloured green, and used as an ophthalmic ward, as is the ward in the north-east corner.

The 2 end wards in either wing on the upper story are 64½′ long, 24½′ broad, and 20′ high. They each contain 14 beds, so that each bed has 113 square feet and 2,257 cubic feet.

The roof is planked on the inner side, and covered with tiles, with a ridge ventilator over the centre of each ward. The inner verandahs are used as dining rooms on the west side. The wall between the inner and outer verandah has windows in it with revolving glass fanlights over them. There are also clerestory windows under the eaves of the roof in each ward, but they do not admit air, as they are fixed.

The central ward in each wing is 63¾′ long by 24′ broad and 20′ high, and accommodates 14 beds; each bed, therefore, has 117 square feet and 2,336 cubic feet.

There is no privy or fixed urinal in the upper story, but at night a urinal tub is placed at each end of the building in the outer verandah. At either end of the hospital on the east side on the ground floor there is a covered passage running in a straight line for 20 feet, and then branching north and south for 33½ feet, leading to the bath-room for patients suffering from venereal disease and to the privies in which there are 5 compartments with a seat at the end, but no door in front to ensure privacy. The walls of either sides of these passages are open brick work, but on the inner side of each passage is the bath-room, 24′ × 14′, the water from which is led through open stone drains to the outside of the boundary

wall, where it stagnates. In the compound on the south-west corner are the apothecaries' and hospital writers' quarters with their subsidiary buildings behind, and between these and to the south of the hospital, from which it is separated by about 50 yards, is a building containing 3 wards, each 24′×15′× 20′, for the accommodation of 3 patients. A broad verandah of 12 feet extends on the east and west side of this building. The arches of the verandahs are protected by sunshades. The floors of the wards are asphalted.

At the end of the east verandah is a store-room for medicines and for records. This building is level with the ground on the north, but on the south has a plinth of about 3 feet. The ventilation of each ward is effected through the doors and clerestory windows. One of the wards is used for isolating patients with infectious diseases, and one is reserved for men detained for the day. Behind this building on the east is a cart shed, which is not used, as it is too low for the ambulances now in use, and a lean to outside for the bullocks and further back on the east are 3 ranges of brick huts for the native servants attached to the hospital. These huts are, in my opinion, much too close to the hospital; but it would be difficult, as long as the present well on the sloping ground to the east of the hospital—No. 35—is used for the drinking water-supply of the hospital, to find another site for them, indeed as it is they are in much too close proximity to it. The privy for the servants is outside the compound on the slope of the hill and on the catchment area of the well. Behind the hospital is the purveyor's house and 2 buildings used as his store-room, and at a little distance behind the centre of the hospital is the cook-house, with a lamp room at one end and a store-room at the other, where wood is kept.

In the east of the compound is the dead-house in a bomb-proof building containing 2 rooms, and outside it on north-east a new range of buildings for 3 native medical pupils and 2 hospital assistants: a mat and grass hut for small-pox patients has also been erected outside the compound and between it and the Artillery hay-stack. The guard room is on the west, near one of the main entrances, and near it are the ambulance sheds; and at the north end the quarters for 2 assistant apothecaries and 2 apprentices, with the subsidiary buildings behind.

The old female hospital is now converted into wards for treatment of male patients.

It is a one-storied building with a low plinth. There is a verandah, 12′ broad, on the west and east, but at either corner on the north and south it has been enclosed to form 2 rooms, 12′×18′, separated by a passage. There are 2 wards in this building, one 98′×24′×19′ high for 20 beds, and the other 20′ ×24′×19′ for 4 beds. The verandah in front and rear of the smaller ward has been enclosed, and a ward for 2 men made in the west verandah. The hospital orderly occupies one of the verandah rooms on the south end and a patient the other. The ventilation of the main wards is effected through doors in the outer wall of the verandah, and through the arched doorways leading from the verandah into the ward.

There are also clerestory windows which open. The ceiling is planked, and has communication with four ventilating openings in the ridge of the roof, which is tiled.

The roof of the verandah is flat, and during heavy rains leaks.

At either end of the building on the east is a passage, 55 feet long, leading to a latrine which on the south has 4 seats, whilst that on the north contains 7 seats. In each privy there is a urinal. Two wash-houses project from the east verandah, the water from which runs through a channamed gutter into the compound of the Heavy Battery lines, where it stagnates on the gathering ground of well No. 28.

The Auxiliary Hospital.

Was formerly the Cavalry Hospital, and is situated on the high ground to the south-west of the Cavalry barracks, but the plateau on which it stands is separated by a valley through which one of the principal nálás on the western

face finds its way down the slope of the hill and through the low-lying ground to the Gumbir River. The hospital consists of a two-storied building standing in a large enclosed compound, on the north side of which are placed the servants' houses, which are very good buildings for natives: the privy for their use is situated outside the compound on the watershed of the nâla running past well No. 14. The building is not a good one, and is badly ventilated. The space between the foot-rests is filled with dry earth, and receives the nightsoil and urine, but after use the occupant has to walk round to the back for ablution purposes—a most objectionable arrangement. A Goodfellow's latrine would be much better in every respect. The dead-house is on the north-east of the hospital compound, on the north-west corner of which there is a wattle and daub shed for the treatment of contagious diseases.

The hospital consists of 4 blocks—2 large ones at either end and 2 smaller in the centre. They are separated from each other by a passage 12 feet wide. The ground floor is built of stone, but the upper story of brick.

The building has a frontage of 373'-6", and stands on a plinth which varies in height, the lowest end on the south being only about 1 foot above the ground, whilst on the north end it is about 4 feet high.

An arcaded verandah, 12 feet broad, extends around the building on each story. The arches are provided with sunshades.

On the lower floor of the northern block are the quarters for the apothecary, assistant apothecaries and apprentices, and Surgeon's consulting room and the purveyor's store-room; and a ward, which was originally intended for men detained for the day, is converted into a dining-room in the north central block, whilst the dispensary, office, and medicine store-room are in the south central block, and in the south block there is a ward with 8 beds for women which adjoins the matron's quarters. The ground floor is throughout paved with trap stone.

The rain water from the roof is discharged through iron pipes on to the surface of the ground, and the refuse water from the medical subordinates' quarters, &c., is received into iron receptacles, from whence it is removed by a cart.

In the centre of the building a wooden staircase leads to the upper story, and opens into the verandah on the west side between the 2 central blocks. At either end, north and south of the building, are 2 projections which are separated from each other by an air space of 25 feet. On the upper story the projection on the east forms the latrine, and that on the west the wash-house. Each of these projections is approached from the outside by a stone staircase, and from the wards through the verandah; but only men who are too ill to go downstairs are allowed to use these latrines and wash-houses. Behind each latrine on the upper floor is a trap-door for the purpose of lowering the iron receptacle down to an enclosed chamber below the staircase. The upper story was designed for the sole accommodation of the sick; but since the establishment of the Station Hospital one of the day rooms on the ground floor has been used as a ward for women and another room as quarters for the matron. Each of the end wards contains 18 beds, and measures 94' long by 24' broad and 21' high to the ceiling, which is planked, and has ventilating openings in it. The roof is covered with corrugated iron, and has a continuous ridge ventilator. The ventilation of the wards is also effected through clerestory windows under the ceiling and by revolving fanlights over the 5 doors on either side which open into the verandahs; there is also a door at each end of the ward, which communicates with the verandah; the 2 central blocks are, as it were, retired for a space of 17'-6" from the west front, and project for a like distance from the main building on the east. The length of the 2 central blocks being 97 feet, the verandahs of each end block are separated from each other by this distance.

This construction has been designed for ventilation and to admit of the ward attendant being able to supervise the patients in the end and adjacent central wards, and, consequently, his room, 12'-6"×12', has been placed in a portion of the verandah between the 2 adjoining blocks, so that he can look through a window on either side into them.

In the projection on the east side a scullery, 12′ × 16′, has been made, but part of this has been boarded off to provide rooms in which close stools can be kept, though one of these has regular privy seats.

One of the central blocks forms a ward, 38′ × 24′, for 8 patients, and the other is divided into 2 rooms for the isolation of particular cases. The floors on the upper story are asphalted, but it has been found necessary to place stone slabs below the feet of the iron beds.

The accommodation on the upper story is for 50 beds. The verandahs on the west side are protected not only by sunshades between the arches, but also by louvred venetians in which there is a sliding window which extends between the sunshades and the parapet wall, which is about 3½ feet above the verandah. The parapet is supported by brick arches which admit rain, although endeavours have been made to prevent this by partially closing them.

The cemented roofs over the verandahs leak during heavy rain, but the building is in every other respect a very fine hospital, and well designed in every way.

The cook-room is on the north-east of the hospital. On the south-west corner is the wash-house, which has a smaller room attached to it for venereal cases. The urinal adjoins this.

The wastage water from the bath-room on the upper floor and from the wash-houses below flows through a chunamed gutter to outside the wall of the compound, where it forms an offensive pool on the gathering ground of well No. 15.

The latrine, where dry earth is used, is on the south-east of the hospital, and is kept very clean.

In the compound on the south of the hospital is a building in which the soda-water machine of the 17th Lancers is kept. During this month (September) about 26 dozen of soda-water and lemonade are used daily, but during the hot weather as much as 40 dozen are consumed daily. The water is brought from the library well, and is carefully filtered. Further on is a shed where the ambulance carts and hearse tumbril stand.

The female hospital is used for the treatment of all the women in camp. It is a single-storied brick building standing on the slope towards the south. The north end of the plinth is about a foot high, and the south 3 or 4 feet. It has a corrugated iron roof and a continuous ridge ventilator; a broad verandah of 12 feet extends on east and west. The building contains 4 wards—2 small ones for 2 beds each, one for patients detained for the day and the other for lying-in cases—and a main ward with 8 beds, beside a ward for special cases containing 2 beds.

The floors are asphalted, and ventilation is effected through opposite doors and clerestory windows. On the south end leading from the verandah is the wash-house and privy. The quarters for the assistant matron are on the end of the west verandah, besides a room used for medical stores. The building is an excellent one throughout. The storm water falling on the roof is carried off through iron pipes to the ground.

A wattle and daub hut for contagious diseases among the women is erected in the south-west corner of the compound. There is a well in the compound, but it is not now used, and the water for the hospital is brought from wells Nos. 14 and 15.

Garrison Cells.

The garrison cells are situated in the Fort. Those on the ground floor are sufficiently ventilated; but those above the gateway are not, from the want of space and ventilation, in my opinion, fit places in which British soldiers should be kept in confinement.

Lock Hospital.

The Lock Hospital is situated on the north-east of camp in front of the Commissariat Lines. It is well away from the barracks and officers' bangalows.

I learn from the annual report for 1882, which has been kindly forwarded to me by Deputy Surgeon General Fraser, that only such women who are known to cohabit with European soldiers are registered. Surgeon Major Taylor says :—

"They are, as a rule, of the lowest and dirtiest description of prostitutes, filthy in their habits and generally intemperate."

He also says :—

"Registration, to the extent that it has been carried out, is efficient, but there are many women not registered prostitutes who are sources of disease."

The average number of prostitutes on the register in 1882 was 73·6 against 86·1 in 1881, among whom 220 cases of disease were found at the periodical examinations which are held once a week, against 207 in 1881 ; the average number of women in hospital being 11·6 against 17·8 in the previous year.

The total number of women treated during the year was 247, as 27 remained in hospital on the 1st January. The record of diseases is as follows :—

Average Strength.	Gonorrhœa.	Syphilis, Primary.	Do. Secondary.	Gleet.	Leucorrhœa.	Menorhagia.	Ulceration of Os Uteri.	Wound of Fore-arm.	Uterine Catarrh.	Ulcer.	Total.
73·6	80	92	7	10	36	8	8	1	4	1	247

The following statement shows the extent of the various forms of venereal disease among the European troops at Mhow during 1882 :—

Corps.	Average Strength.	Primary Syphilis.	Secondary Syphilis.	Gonorrhœa.	Total.	Ratio per 1,000 of Strength.
17th Lancers	408	14	10	25	49	120·1
D/B, R. H. A.	254	1	...	1	2	153·5
A/4, R. A.		3	1	17	21	
5/1, R. A.		8	...	8	16	
2nd Lancashire Fusiliers Depôt, Gloucestershire Regiment	685	102	29	114	245	359·0
				2	2	
Garrison Staff	3					
Total ...	1,350	128	40	167	335	248·1

The much higher ratio of admissions among the Infantry may perhaps be ascribed to the more idle life the Infantry soldier leads in India.

Surgeon Major Taylor says :—

"The Lock Hospital has had a marked salutary influence in reducing the number of admissions from venereal disease. The percentage of venereal diseases to strength was during 1882 less by 2·63 than in 1881."

Surgeon Major Forsayeth in his report for 1881 says :—

"I am convinced that the prevalence of venereal disease has been due to the men having intercourse with unregistered women both in and around the Cantonment. I am of opinion that the Contagious Diseases Act should be extended so as to bring a circle of 4 miles around Cantonment under its control ; otherwise I fear that a permanent reduction of venereal among European soldiers cannot be effected. The only benefit of the present system has been to eradicate the severer forms of constitutional affections which are now rarely seen in hospitals of European troops. This, of course, is a great advantage, and cannot be too highly appreciated. I further believe that in a Military Cantonment

like Mhow it is practically impossible to discriminate between prostitutes who go with Natives and those who consort with Europeans; therefore all prostitutes or women ofloose character should be brought under the Act, and more power given to the police authorities for their apprehension and registration than at present exists."

Surgeon Major Taylor in his report for 1882 says:—

"The same extension that was strongly recommended by Surgeon Major Forsayeth last year is urgently recommended now. From a knowledge of the number of admissions into the Station Hospital during the time I was in medical charge of cases of venereal contracted just beyond Cantonment limits, I quite agree with Surgeon Major Forsayeth's opinion that it is futile to hope for suppression of prostitution until the rules are extended, as he suggested."

I quite concur with these opinions; and though at present the rules cannot be extended by Government, as the country beyond the limits is foreign territory, I advise that pressure be brought to bear on the Darbár to grant this extension, and that *all prostitutes* living within a radius of 4 miles of Cantonment be registered.

The total cost of working the Act in Mhow in 1882 amounted Rs. 3,439-6-3, and in my opinion the results attained are not commensurate with this large expenditure; but this is solely due to limitation of the provisions of the Act and to the restricted area over which it extends.

Water-supply.

The military and civil population at Mhow is entirely dependent on surface wells for its water-supply, for there is no deep spring in Mhow, and the storm water sinks into the moorum and thus finds its way along the surface or into cracks of the subjacent trap; and when it is remembered that the gathering ground is thickly populated by a large garrison with its numerous native followers, animals, &c., &c., and that there is a native population exceeding 22,000 persons, it must be evident that the filtering medium must become choked with impurities in time, and some of these must get washed into the wells. Major Gibbs informs me that in the lower lying ground it is probable that a certain amount of infiltration from the nálás occurs, as these are dammed up in places, and their level is thus abnormally raised; but that very few of the wells in the lines that are used for drinking purposes can be affected in this way, as the difference in the levels is too great. As before described, the wastage water from the bath and cook rooms attached to the barracks is carried for a few yards from these buildings through open drains which end on the ground into which it soaks at a higher level than the wells. This is a dangerous practice which should be stopped, for it should at all times be remembered that the water in the wells runs the greatest risk of becoming contaminated, especially as they are, for the most part, sunk in a porous soil, and are not defended by any external layer of concrete, so as to ensure filtration through the soil for a depth of 20 feet before any water can enter the well.

The following list, showing the depth of wells as well as of water in them from November 1881 to 15th September 1882, has been kindly placed at my disposal by Major Gibbs, the Executive Engineer, and contains much useful information.

As might, indeed, be expected, most of the wells on the higer level run dry or nearly dry, some as early as February, but many in the hot weather.

The list refers only to wells in the regimental lines, and does not embrace those in the bázár:—

List of Wells in Mhow, showing Depth of Well and Water in the same from November 1881 to 15th September 1882.

No. of Wells.	Names of Wells	Depth of Well from top parapet.	Depth of Water on 1st November 1881.	Depth of Water on 1st December 1881.	Depth of Water on 1st January 1882.	Depth of Water on 1st February 1882.	Depth of Water on 1st March 1882.	Depth of Water on 15th March 1882.	Depth of Water on 30th March 1882.	Depth of Water on 15th April 1882.	Depth of Water on 30th April 1882.	Depth of Water on 15th May 1882.	Depth of Water on 30th May 1882.	Depth of Water on 15th June 1882.	Depth of Water on 30th June 1882.	Depth of Water on 15th July 1882.	Depth of Water on 31st July 1882.	Depth of Water on 15th August 1882.	Depth of Water on 30th August 1882.	Depth of Water on 15th September 1882.	
		F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.	F. I.
1	Extreme north of N. I. Lines	31	6 6	8	2	4	3	3	2	6	6	2	3	2	2	2	2	2	2	2	2
2	N. I. Lines north of Wood School	40	9 12	10	4	6	5	5	4	8	8	4	5	4	4	4	4	4	4	4	4
3	N. I. Lines south of East School	41	17 2	11	6	8	7	7	6	9	9	6	7	6	6	6	6	6	6	6	6
4	North-east of N. I. Lines	41	11 8	15	10	12	11	11	10	13	13	10	11	10	10	10	10	10	10	10	10
5	North-west of N. I. Lines	41	15	15	12	13	12	12	11	14	14	11	12	11	11	11	11	11	11	11	11
6	In the old or south N. I. Hospital compound	75	43	48	39	37	36	36	35	38	38	35	36	35	35	35	35	35	35	35	35
7	North of east Cavalry stables	50	17 10	14	6	12	6	12	11	9	11	9	9	8	8	8	8	8	8	8	8
8	North-west of Cavalry stables	46	16 3	11	3	11	8	10	9	6	11	6	7	7	7	7	7	7	7	7	7
9	European Cavalry Horse Trench Well	42	6 14	12	2	10	6	9	6	10	11	8	10	7	6	6	6	6	6	6	6
10	European Cavalry south-west of Quadrangle	42	8 14	12	2	15	11	6	9	7	10	5	10	5	5	5	5	5	5	5	5
11	West of new Cavalry Barrack No. 6	37	6 14	12	9	12	9	12	10	4	7	6	8	3	9	16	9	6	6	7	6
12	Colonel Fitzwigram's Well	118	9 65	81	9	59	9	59	46	3	45	2	16	2	2	2	2	2	2	2	2
13	West of No. 5 Cavalry Barrack	58	4 20	3	20	6	16	9	14	3	15	6	15	6	6	6	6	6	6	6	6
14	South-west of No. 5 S. C. Cavalry Barrack	55	2 17	9	16	6	14	12	13	11	11	9	12	10	10	10	10	10	10	10	10
15a	New well near Gymkhana	55	3 17	4	16	19	18	16	14	13	14	13	14	13	13	13	13	13	13	13	13
15	North-west of European Cavalry Hospital	38	4 17	3	15	9	13	8	11	6	11	6	10	6	6	6	6	6	6	6	6
16	Public Works Store-yard	54	29	3	27	20	25	6	19	5	18	6	8	1	1	1	1	1	1	1	1
17	Public Works Office-yard	54	3 12	3	10	3	8	3	6	3	6	3	6	3	3	3	3	3	3	3	3
18	In Cavalry Hospital compound	60	13	3	10	3	8	3	6	3	6	3	6	3	3	3	3	3	3	3	3
19	South-west of Gymkhana ground	58	19	6	16	6	14	6	12	6	12	10	8	7	7	7	7	7	7	7	7
20	South of old staff Hospital	67	6 13	6	11	3	9	3	8	3	8	3	7	3	3	3	3	3	3	3	3
21	South-west of Commissariat Stores	69	9 34	3	32	3	29	3	28	3	28	3	28	3	3	3	3	3	3	3	3
22a	New well near Elephant Lines	80	6	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
22	North-west of Mhow Library	43	32	19	6	16	9	14	5	9	8	11	9	12	12	11	3	10	9	9	9
23	North-west new Library	43	32	18	6	16	6	14	5	9	8	11	9	12	12	11	3	10	9	9	9
24	Well in Commissariat Slaughter-yard	50	23	19	8	15	9	13	6	9	8	9	7	8	7	7	7	7	7	7	7
25	South of do. do.	54	3 28	8	25	9	21	9	19	6	18	9	14	4	13	4	13	4	13	4	13
25a	South-west of Commissariat Cattle-shed	76	31	4	27	19	24	18	20	14	19	11	16	11	11	11	11	11	11	11	11
25b	In new Cemetery	53	6 28	4	27	19	24	18	20	14	19	11	16	11	8	8	9	9	9	9	9
26	North of R. A. Racket Court	66	4 46		43		36	9	32	1	29	4	4	6	6	1	4	3	4	3	3
27	In the Fort	100	15 58		55	16	50	16	46	3	45	2	30	2	2	2	2	2	2	2	2
28	North of Royal Artillery Bullock Stables	47	9 27	9	22	9	18	6	13	11	12	6	12	1	1	1	1	1	1	1	1
29	West of do. do.	53	7 30	5	28	3	26	3	24	3	24	3	13	3	3	3	3	3	3	3	3
30	South of Fort inside intrenchments	42	19	10	16	6	13	6	11	6	11	6	11	6	6	6	6	6	6	6	6
31	East of R. A. Bullock Stables	57	19 37		35	4	34	9	19	11	16	3	5	16	4	2	1	1	1	1	1
31a	Royal Horse Artillery Plunge-bath	63	32	6	26	6	23	6	21	6	21	6	21	6	6	6	6	6	6	6	6
32	East of R. H. A. Barrack	63	26	6	24		20	9	19	3	19	9	18	6	16	3	2	1	1	1	1
33	South-west of Fort	57	9 18	3	17	3	15	3	14	9	13	9	12	3	11	4	10	3	9	8	8
34	South-west of Ordnance Line	57	9 18	3	17	3	15	3	14	9	13	9	12	3	11	4	10	3	9	8	8
35	South-east of E. I. H.-spital	84	43	6	39		36	18	9	2	6	3	4	3	3	3	3	3	3	3	3
35a	West of R. H. A. Barrack No. 1	100	24		21		17	17						1	1	1	1	1	1	1	1
36	East of old E. I. Barrack	76	6 31		30	20	28	6	18	6	17	6	8	4	6	6	6	6	6	6	6
37	West of P. W. D. Subordinates' Quarters	78	10 16	6	15	4	12	6	8	1	6	6	5	5	10	6	11	5	6	6	6
38	West of main road on south-east of Officers' Quarter, European Infantry Lines	105	9 30		28	9	25		21	3	20		20	3	3	3	3	3	3	3	3
39	European Infantry plunge-bath well	82	9 71		67	9	60		11	5	13	9	3	1	1	1	1	1	1	1	1
40	South-west of E. Officers' Qr., E. I. Lines	45	36		19	9	17		14	10	13		13	1	1	1	1	1	1	1	1
41	South of No. 5 new E. I. Barracks	58	3 39	6	18	3	16	3	15	9	14	3	11	4	10	6	9	6	8	6	6
42	South-west of new E. I. Patcheries	63	9 12		10	6	8	6	7	3	6	3	5	3	3	3	3	3	3	3	3
43	In European Infantry Soldiers' Garden	43	36		34		31	6	19	3	17		16	6	15	3	14	9	12	9	9
44	New well near E. I. Rifle Range	37	6 31	6	29	6	26	6	18	3	17	9	14	9	12	9	12	9	11	9	9

The following analyses of the well waters in Mhow by Assistant Surgeon Kaka show that of 23 wells in the regimental lines, 14 yielded good water, 6 are described as being only fair, and 3 were found to be actually bad. All the wells examined in the Sadar Bázár were bad, as well as those in villages in the close proximity of the camp. It is desirable that an analysis of these waters be made towards the end of the hot season, as I think it would in many instances show different results to those now given.

Number of the sample.	Date.	Station.	Source.	Grains per Gallon.		Parts per Million.		Sediments, &c.	Quality.
				Total Solids.	Chlorine.	Free Ammonia.	Albuminoid Ammonia		
1	Sept. 16th, 1882	Mhow	Well No. 2, Grenadier Lines	40·8	2·52	·026	·12	Vegetable debris, monads, paramœcia.	Fair.
2			Do. No. 5 do.	32·7	2·1	·006	·11	Do. do. do.	Fair.
3			Do. No. 6 in N. I. Hospital compound.	60·2	5·48	·026	·06	Do. do. crystals of mineral matter.	Bad.
4			Do. No. 12	29·2	2·47	Nil	·12	Copious do. do.	Fair.
5			Do. No. 14 (used by the 17th Lancers) (covered).	30·7	2·19	Nil	·05	Do. do. diotamaceæ.	Good.
6	17th ,,		Do. do. filter tub (No. 3 block, 17th Lancers).	31·5	2·19	Nil	·09	Copious do. nematoid worms.	Bad.
7			Do. do. filter tub (No. 3 block, 17th Lancers).	30·9	2·19	Nil	·09	Do. do. do.	Bad.
8			Do. do. Macnamara filter on the same.	30·7	2·19	Nil	·05	Nil	Good.
9			Do. do. from barrel of the cook-room of the 17th Lancers	30·9	2·2	·0132	·2	Vegetable debris, monads, paramœcia, rotifera, nematoda.	Bad.
10			Do. do. filter tub (Auxiliary Hospital, 17th Lancers).	31·0	2·2	·06	·12	Copious, vegetable debris, monads, paramœcia, entomostraca, rotifera.	Bad.
11	18th ,,		Do. do. Macnamara filter in the same.	30·7	2·19	·008	·09	Very scanty, vegetable debris, monads.	Good.
12			Do. No. 14a (covered)	33·6	2·26	·026	·12	Vegetable debris, monads, paramœcia.	Fair.
13			Do. No. 15 do.	29*	2·2	·0122	·08	Very scanty, vegetable debris, monads, paramœcia.	Good.
14			Do. No. 22 (Library) covered.	22·6	1·39	·0132	·07	Do. do. do.	Good.
15			Do. No. 28 (used by the Heavy Battery), covered.	38·5	3·4	Nil	·08	Scanty do. do.	Good.
16	19th ,,		Do. do. after being shaken up in mussock.	40·6	3·4	Nil	·08	Vegetable debris, monads, paramœcia, ova and embryos of entozoa.	Bad.
17			Do. filter tub in No. 1 block (Heavy Battery).	40·9	3·5	·026	·08	Do. do. do.	Bad.
18			Do. Macnamara filter in the same.	38·5	3·4	Nil	·05	Very scanty, vegetable debris	Good.
19			Do. barrel of the cook-room of the Heavy Battery.	44·1	3·43	·026	·13	Copious, vegetable debris, monads, paramœcia, euplotes, conferva, rotifera.	Bad.
20	20th ,,		Do. No. 29	30·1	5·95	·0132	·06	Vegetable debris, conferva, monads, paramœcia.	Good.
21	Jan. 16th, 1883		Do. No. 24 (analysed at Chandni).	46·9	4·34	·0132	·06	Scanty, vegetable debris, monads, paramœcia.	Good.
22	Sept. 20th, 1882		Do. No. 35 (covered) near Station Hospital.	25·9	1·5	·008	·09	Very scanty, vegetable debris, monads.	Good.
23			Do. after being shaken up in mussock.	30·0	1·5	·08	·16	Copious, vegetable debris, monads, paramœcia, rotifera.	Bad.
24			Do. filter tub in Station Hospital.	30·0	1·5	·08	·16	Do. do. do.	Bad.
25			Do. Macnamara filter in the same.	25·6	1·5	·008	·09	Nil	Good.
26			Dy. barrel of cook-room in the same.	31·2	1·7	·212	·26	Copious, vegetable debris, monads, paramœcia, entomostraca, rotifera, verticella.	Bad.
27	21st ,,		Do. No. 35a (covered) used by Field Battery.	23·8	·64	·026	·09	Vegetable debris, monads, paramœcia, bursarina.	Good.
28			Do. after being shaken up in mussock.	23·8	·64	·026	·09	Vegetable debris, monads, paramœcia, bursarina, rotifera entomostraca.	Bad.
29			Do. filter tub No. 1 block, Field Battery.	23·8	·64	·026	·09	The same as above	Bad.
30			Do. Macnamara filter in the same.	23·1	·60	·0132	·044	Very scanty, vegetable debris	Good.
31			Do. barrel of the cook-room of the Royal Artillery.	25·4	·7	·026	·07	Vegetable debris, monads, paramœcia, rotifera.	Suspicious bad.
32	22nd ,,		Do. No. 41, covered, (used by the 20th K. L.).	25·9	·91	·0132	·08	Scanty, vegetable debris, monads, conferva.	Good.
33			Do. after being shaken up in mussock.	25·9	·91	·0132	·11	Do. do. do.	Fair.
34			Do. filter tub (No. 2 block, 20th K. L.)	25·9	·91	·026	·11	Do. do. do.	Fair.
35			Do. Macnamara filter in the same.	25·0	·9	·0032	·13	Do. do. do.	Bad.
36			Do. barrel of the cook-room of the 20th K. L.	30·0	1·62	·052	·16	Copious, vegetable debris, monads, paramœcia, verticella, entomostraca.	Bad.
37	23rd ,,		Do. No. 42	21·0	1·12	Nil	·06	Very scanty, vegetable debris	Good.
38			Do. No. 43	22·1	·8	·026	·09	Vegetable debris, algæ, conferva, monads, paramœcia.	Good.
39			Do. after being shaken up in mussock.	22·1	·8	·026	·10	Copious, vegetable debris, algæ, conferva, monads, paramœcia, nematoda.	Bad.
			Wells in No. 6 Conservancy Section used by Officers of the 17th Lancers.						
40			Well in Officers' Mess (17th Lancers)	40·0	4·	·04	·11	Scanty, vegetable debris, monads, paramœcia.	Fair.

Number of Samples	Date.	Station.	Source.	Grains per Gallon.		Parts per Million.		Sediments, &c.	Quality.
				Total Solids.	Chlorine.	Free Ammonia.	Albu. minoid Ammonia.		
41	Sept. 23rd, 1882	Mhow	Well in compound of No. 55 bangalow.	39·2	3·15	·0132	·09	The same as above ...	Good.
42	24th ,,		Do. on side of No. 56 bangalow.	55·3	7·84	·026	·08	Vegetable debris, confervæ, monads, paramecia, crystals of mineral matter.	Fair.
43			Do. behind the same bangalow	74·9	8·56	·0132	·06	The same as above	Bad.
44			Do. in compound of No. 54 bangalow (Captain Shawe's)	63·	7·21	Nil	·09	Do. do.	Bad.
45			Do. in Major Belford's bangalow No. 40.	33·6	3·57	·0132	·08	Scanty, vegetable debris, monads.	Good.
46			Do. on south side of No. 102 bangalow.	23·1	1·75	·026	·09	Do. do. do. ...	Good.
			Bázár Wells.						
47	25th ,,		Well, C. C. No. 10	166·	24·	·026	·14	Vegetable debris, monads, paramecia, confervæ, rotifera.	Bad.
48			Do. C.C. No. 11 ...	200·	27·3	·026	·2	The same as above, crystals of mineral matter.	Bad.
49			Do. C.C. No. 22	173·6	23·	·0132	·12	Do. do. entomostraca.	Bad.
50			Do. C.C. No. 23	135·1	17·	·026	·2	Do. do.	Bad.
51			Do. C. C. No. 37	56·7	3·9	·0132	·15	Do. do. do.	Bad.
52			Do. Jivanji's	77·	9·1	·026	·08	Vegetable debris, monads, paramecia, confervæ.	Bad.
			Wells (Bázár) analysed at Chandni (January 16th, 18th)						
53	Jan. 16th, 1883		Roobiram Chowdri's in Raj Mohulla.	77·	6·86	·0132	·07	Vegetable debris, monads, paramecia.	Bad.
54			Well No. 5 in Raj Mohulla ...	50·7	4·34	·026	·07	Scanty, vegetable debris, monads	Fair.
55			Do. Gungaram's ...	158·2	19·95	·026	·08	Vegetable debris, monads, paramecia, crystals of mineral matter	Bad.
56			Hiralal's Bavri	114·8	17·85	·052	·10	The same as above	Bad.
57	17th ,,		Well Rustomji Nanabhoy's ...	40·	3·	Nil	·06	Scanty, vegetable debris, monads	Good.
58			Do. Aderji's (Bakery road) ...	119·9	17·91	·0132	·12	Vegetable debris, monads, paramecia, rotifera, crystals of mineral matter.	Bad.
59			Do. No. 7 in Khitmagar Mohulla.	93·1	12·81	·026	·07	Copious, vegetable debris, paramecia, mineral matter.	Bad.
60	18th ,,		Do. Sweeper's	144·9	20·58	·026	·12	Copious, vegetable debris, paramecia, rotifera.	Bad.
			Samples from prostitutes' houses						
61	Sept. 25th 1882		Water from prostitutes' house No. 1811a.	23·1	2·31	·132	·17	Copious, vegetable debris, monads, paramecia, rotifera.	Bad.
62	26th ,,		Do. do. do. 1817c.	79·1	8·75	·266	·3	The same as above, crystals of mineral matter.	Bad.
63			Do. do. do. 1785a.	29·5	2·31	·026	·17	Vegetable debris, monads, paramecia.	Bad.
64			Do. do. do. 1784b.	70·	5·95	·026	·16	Do. do. rotifera.	Bad.
65			Do. do. do. 1786a.	33·6	3·08	·0132	·13	Do. do do. ...	Bad.
66			Well at Gujiakhári Village ...	66·	7·	·04	·12	Copious, vegetable debris, monads, paramecia, rotifera.	Bad.
67	27th ,,		Water from a mochi's house at the same village.	18·2	1·47	·026	·13	The same as above	Bad.
68			Sata River at Gujiakhári Bridge.	33·6	2·4	·026	·16	Copious, vegetable debris, monads, paramecia, rotifera.	Bad.
69			Well at village of Pansiempura.	70·	8·25	·026	·09	Scanty, vegetable debris, monads, paramecia.	Bad.
70			Well at Gowlipura Village ...	69·2	9·23	·03	·09	Vegetable debris, monads, paramecia,	Bad.
71			Well at Gangliakhári Village ...	26·6	1·99	·08	·16	Vegetable debris, monads, paramecia, euplotæ, confervæ, rotifera.	Bad.
72	28th ,,		Well at Kisunpura Village ...	50·6	5·2	·0132	·12	Vegetable debris, monads, paramecia, rotifera.	Bad.
			Aerated Waters, &c.						
73			Water mixed with soda after filtration from Mr. Jivanji Edalji's shop (Jivanji's Well).	208·6	10·01	·132	·15		Bad.
74			Ditto before filtration from Mr. Dinsha Shapurji's shop (Jivanji's Well).	...	...	·044	·13		Bad.
75			Water mixed with oil of lemons and syrup from Mr. Merwanji Cawerji's shop after filtration (Library Well).	23·	1·96	·0132	·08		Good.
76			Soda water from Mr. Merwanji Cawerji's shop.	...	...	·0132	·11		Fair.
77	29th ,,		Ditto from Mr. Dinsha Shapurji's shop.	...	...	·04	·15		Bad.
78			Ditto from Mr. Jivanji Edalji's shop.	...	...	·14	·15		Bad.
79			Soda water from prostitute's quarter from the house of one Vajirkhan, No. 1808a.	209	10·	·132	·2		Bad.
80			Well in Ice Factory	68·	10·15	·026	·06	Scanty, vegetable debris, monads, crystals of mineral matter.	Bad.
81			Ice	9·1	2·1	·08	·16	Crystals of mineral matter ...	Bad.

Wells Nos. 41 and 42, from which the European Infantry draw their water-supply, are situated below the hill on the south of the barracks, and yield pure and wholesome water. Well No. 41 was 58′ 3″ deep in November 1881, but had apparently silted up, as on the 18th June 1882 it had only a depth of 56′ 6″. On the 31st May the water had decreased from 29′ 6″ in November to 6′ 6″. It is covered with flat wooden planks, which are spiked.

Covered well No. 35 A supplies the Field Battery, and is situated on the slope of the hill to the west of the barracks. In November 1881 it was 80′ deep, and contained 34′ of water; but it was dry in the following March, when the opportunity was taken to deepen it to 87 feet. The water in this well is not so good as in well No. 41; as, although the total solids and chlorine were less in quantity, it contained double the amount of free ammonia and slightly more albuminoid ammonia. It may, however, be classed as fairly pure water.

Covered well No. 35, or the Station Hospital well, was 84′ deep in November 1881, but in September 1882 only 83′ deep. It held 43′ 6″ of water in November, but in the following March there were only 2′ 6″, and on the 31st May only a foot of water in the well. The water at the time of the analysis was classed as good, but the chlorine in it (1·5 grain per gallon) is more than double that in well No. 35A. The gathering ground of this well has on its surface many sources of impurity, as the quarters of the servants attached to the hospital, &c., are on it, and it must always, in my opinion, be regarded as a suspicious source of drinking water. The ground below the parapet wall was at the time of my inspection very dirty.

Covered well No. 28 is situated on the north of the bullock stables belonging to the Heavy Battery. It was 47′ deep in November 1881, when it contained 27′ 4″ of water; but was dry in May, when it was deepened to 50′ 6″. At the time of the analysis there was no free ammonia and the albuminoid ammonia was not in excess, but the water contained a large amount of total solids (38·5 grains per gallon) and much chlorine (3·4 grains per gallon). This renders it a suspicious water, especially as it is at a lower level than the barracks, privies, and bullock stables, and it must at all times be liable to pollution from these sources.

The supply for the Cavalry is derived from well No. 14, and occasionally from well No. 15. No. 14 was 35′ 2″ deep in November 1881, when it contained 17′ 9″ of water; on the 31st May it still held 6′ 6″ of water. It is covered with spiked wooden planks fitted with trap doors, which are always kept open, through which the water is drawn. The bhistis in spite of the spikes stand on the cover, and the parapet wall is so low that much filth is blown into it. No. 15 is an open well about 100 yards south of No. 14. A nála whose surface in the dry weather was seen to be in parts very unclean, and which in the rains must convey much impurity, passes between the wells, and sometimes when swollen it is said to top the parapet wall of No. 14 well.

The surface near each well is not, in my opinion, as well looked after as it should be, as on more than one occasion I found much filth in their immediate neighbourhood. The water spilt by the bhistis is supposed to be carried off by a drain, but it was blocked up by solid matters, dead leaves, &c., washed or blown into it. Native carts pass from the road below up through the Cavalry Lines to the bázár, and this traffic is not conducive to the cleanliness of the gathering ground.

The water in each of these wells is classed by the analyst as good; but the comparatively large amount of chlorine, respectively 2·19 and 2·20 grains per gallon, as well as the increased amount of total solids render them, in my opinion, unsafe sources of drinking water, as they are liable to be contaminated at any time by impurities finding their way into them from the upper levels; and from their proximity to the public road, dust, leaves, &c., are blown into them.

The increase of total solids, chlorine, free and albuminoid ammonia is well shown in the analysis of the water from well No. 14 A, which is situated on the other side of the road, only a few hundred feet from well No. 14, but on a lower level.

The library well No. 22, which is covered by spiked wooden planks, is used by many of the residents in camp, and it has a local reputation of supplying the best water in camp. It is situated at the junction of four roads, and is only

separated by the width of the road from the compound of the library. It was 48' deep in November 1881, when it contained 22 feet of water, but on the 31st May there were only 3' 4" of water in it. The water in the well is not the purest in camp, but at the time of examination it was very fairly pure. It contained 1·39 grains of chlorine per gallon, and the determination of free and albuminoid ammonia was not in excess; but it is, in my opinion, liable to be contaminated at any time, as the servants' privy in the compound of the library is on higher ground and only 114 feet from the well. In September I found a heap of refuse for some days in succession lying outside the privy, which was extremely filthy, the ground all round being wet and soaked.

The privy should certainly be removed to some other site and, if possible, the servants' houses also.

The wells in the Native Infantry Lines are not, as a rule, good. Well No. 2 yields a water which, though classed by the analyst as fair, I regard with suspicion, as it contains 40·8 grains of total solids and 2·52 of chlorine per gallon, whilst the albuminoid ammonia is also high. Well No. 5 yields a better water, though not a good one, and the well in the hospital compound is decidedly bad.

The water in the wells in the compounds of the officers of the 17th Lancers are not good. I regard the well in the Mess compound with great suspicion, although it is classed as fair by the water analyst. The well in compound No. 55 yields a better water, but both wells in the compound of No. 56 are, in my opinion, bad. The well in compound No. 40 yields a tolerably good water, but the high amount of chlorine renders it a suspicious source of drinking water. The well next to No. 102 bangalow is a surface well, and during September the water was good, but it is not a safe source.

Well No. 24, below the Commissariat Lines, though classed as good, is open to grave suspicion, as it contains the high amount of 46·9 grains of total solids and 4·34 grains of chlorine. Its liability to contamination from filth percolating into it from the ground above renders it an unsafe water to drink.

None of the wells from which the troops draw their water can be considered in a satisfactory state. The parapet walls are so low that they offer every inducement to the bhistis to stand on them; and the wooden covers are, in my opinion, only a snare and a delusion. In none of the wells is the brick tube cased *outside* with concrete, as so long urged by the Army Sanitary Commission, so as to cut off the sub-soil water for 20 feet from the well.

The purest source of well waters would, I think, be found along the valley to the south of the general parade ground; and if new wells, constructed on the principles laid down by the Army Sanitary Commission, could be sunk along it, the water might perhaps be pumped up to a reservoir on the top of the hill, and then be laid on by gravitation to each set of barracks. This course seems to me to be urgently demanded, as I am confident much of the illness among the troops at Mhow has arisen from impure water; but, in my opinion, it would be far better for Government, in the interests of the troops, to order the scheme, which the engineers have proposed for bringing in water from a distance, to be at once undertaken. In the meantime the parapet walls of all wells should be raised to a height of 3½ or 4 feet, and their tops be covered over with a masonry dome such as Mr. Gael, the Executive Engineer at Neemuch, has placed over the Commissariat well at that station. There is an old native well in the compound of the Lock Hospital at Mhow, which has a dome supported by brick pillars, which might be copied with advantage.

The water should be raised by a pump, or by an iron bucket and windlass.

This course has been recommended by the Army Sanitary Commission for many years past and also in the reports of the Sanitary Commissioner of the Government of Bombay, but hitherto without any effect.

I wish particularly to call attention to the great deterioration the water suffers from the use of the leathern mussocks in which it is carried from the wells to the filter tubs. In every instance it will be observed that the water becomes contaminated by being thus carried; and I must prominently notice that in some cases the ova of nematoid worms were found under the microscope, not only in the water from the mussock, but also in the filter tubs. As I found two

of the leaden pipes attched to the Macnamara filters in the European Infantry barracks cracked across, it is evident that the men using these filters must have drunk water made impure by the mussock.

It will also be noticed that the water taken from the Macnamara filter in No. 2 barrack, European Infantry, was actually worse than that in the filter tub and mussock, and that the water since leaving the well had *gained* ·08 parts of free ammonia per million and ·05 of albuminoid ammonia. This points to some great defect in the individual filter.

The satisfactory effect of filtration is observed in all the other samples.

I strongly recommend the abolition of leathern mussocks and the substitution of galvanized zinc vessels for the carrying of water for the troops. Such may be made light enough for a man, or, at all events, for a mule to carry, and I think that this plan should be introduced throughout the Army. I also recommend that these vessels be daily cleaned, and after cleaning be inspected by a responsible officer.

It is also, in my opinion, extremely desirable to substitute galvanized zinc vessels for the present wooden filter tubs; and I specially think this should be done in cook-rooms. Wooden vessels after a time get covered with a slimy fungus which cannot fail to be hurtful. A reference to the analyses will prove how contaminated the water used in the cook-rooms becomes.

The water in the prostitutes' houses is also very bad, and so is much of the soda-water and pop sold in the bázár. What is the use of supplying filtered water in the barracks if the men on going to the bázár can drink such impure beverages?

I think this is really a most important point, and would suggest that a filter cart filled with water from an approved source should stand in the Chuckla. Major Murray, Executive Engineer at Nasirabad, has, I believe, some carbide filter carts in store: so perhaps if there are none at Mhow one might be brought down. I also think the soda-water manufacturers should be made to provide themselves with Macnamara filters, which should be periodically examined by the Staff Surgeon. The wells in the bázár are very bad; some contain as much as 175 and 200 grains of total solids and very large quantities of chlorine. These impurities are, without doubt, derived from the surrounding soil.

For many years past the attention of the Military authorities has been directed to the pressing necessity for improving the water-supply at Mhow, and I learn that as much as a lákh and a half of rupees had been saved out of the ábkári revenue for this purpose; but, to the great regret of every one interested in the welfare of the soldiers at Mhow, this sum, I am informed, was appropriated, by order of the Agent to the Governor General at Indore, for the purpose of making feeder roads.

The scheme now consequently in abeyance that had been proposed for supplying Mhow with water will be best learnt from the following description which has been kindly furnished me by Major Gibbs, Executive Engineer, Mhow:—

"A lake is to be formed below the Janapa's Peak and about 5 miles south-west of Mhow by impounding the head-waters of the Gumbir or Gammi River near the village of Bercha. An earthen bund, the greatest height of which is 50 feet, will be constructed between two spurs of the higher peaks in this neighbourhood, making a sort of amphitheatre in the Vindhya range, which here forms a portion of the watershed between the Chambal and Narbada rivers.

"The draining into the lake is about 3½ square miles, and the lake when at its fullest would cover about ½ of a square mile.

"The surface soil is generally of moorum and black soil, and the village of Bercha occupies a small portion of this area. The surface soil in and about this village will have to be dug out and taken away. In other respects, except that there are a few cowherds' huts, the area is fairly clean.

Surface soil.

"At the site proposed for the dam, black soil overlies moorum and trap, and the rock is not altogether free from fissures. But a core of puddled clay, about 6'-8" to 14½' thick, will make the dam less pervious than the soil would otherwise naturally be.

Dam. "The earthen dam will be over 3,500 feet long, with a top width of 12 feet, water slope 3 to 1 pitched with stone, and the other slope 2 to 1.

Water Weir. "Surplus water will make its way over a masonry waste weir 300 feet long, with wings 6' above the sill. The waste weir and outlet channel will be cut in hard moorum.

Outlet pipe. "The face of the hill on the east side will be scraped to allow of a double water tower being built against the rock. A channel will be cut on the water side of the tower to lead the water to it. From the water tower the 10" main pipe will run in a tunnel for some distance, and then under ground with but few bunds up to the European Infantry barracks, about 4½ miles distant. Near these barracks will be constructed a reservoir large enough to hold a seven days' supply for the garrison. From this reservoir the water will be distributed by gravitation to the rest of the Cantonments and bázár.

Service reservoir.

"It is proposed to make a road, 12' wide, along the line of pipes, to facilitate repairs to these and access to the lake. The lowest inlet pipe into the water tower is 48 feet above the level of the plinth of the highest barrack.

* Daily supply 6,000 troops, &c., 20,000 in the bázár. "The daily supply is calculated at 15 gallons per head for a population of 26,000*, besides 25,000 gallons for the railway; and proposals have been made to make use of any surplus for purposes of irrigation, as the Indore Darbár is anxious that this should be arranged for.

"The scheme was based, as far as its financial aspect is concerned, on the assumption that Government will give one-third of the total cost (Rs. 5,71,441), and that the other two-thirds will be lent by Government without interest. This loan, it is expected, could be paid off in about 10 years by a water-rate aggregating Rs. 23,000 per annum, made up of a percentage on the rental of houses, and supplemented by a grant from Cantonment ábkári revenue of Rs 25,000 per annum. But it is believed that it has since been considered as a purely Imperial scheme."

Commissariat.

The Commissariat cattle lines are situated on the eastern ridge to the west of the cemetery and south of the Sadar Bázár and within a quarter of a mile of the Artillery barracks: 60 cows and 350 sheep are kept in the pens. The average number of cattle present during the year 1881 is stated to have been as follows:—

Mules.	Elephants.	Bullocks.	Camels.
41	11	28	20

The camel lines are about 1,200 yards east of the Royal Horse Artillery barracks on the watershed of the Satia River.

The slaughter-house is on the east of the Commissariat Lines and south of the cemetery. It is a brick building standing in an enclosed yard. The floor is paved. It is kept very clean, and is flushed down with water drawn from a well in the compound.

The blood, &c., is received into a cesspool, which is daily cleaned. The refuse is carried away by a sweeper. The offal is sold.

The slaughter-house and hanging sheds are of old construction, and not as good as those at Poona or Ahmednagar. About 7 head of cattle and about 20 sheep are slaughtered daily for the use of the troops.

The bakery is situated on the ridge opposite the Post Office in a bomb-proof building. It contains 4 rooms—one for grinding, one for keeping suji, one for kneading, and one containing 4 ovens.

There is another building in which 2 ovens are placed; but Colonel Swinhoe reported them as useless, as bread cannot be baked in them. Hand kneading by natives is employed.

It is much to be desired that, in an important station like Mhow, the second largest Cantonment in the Bombay Presidency, a steam bakery, such as at Poona and Karáchi, should be built. The great superiority of machinery for cleaning purposes is admitted by every one; and if a steam bakery were built it would do away with hand kneading, which is most objectionable, especially in this country.

The quality of the rations supplied has always been reported by medical officers as good, but at times the meat is said to be lean, and to have very little fat. The absence of green grass during 8 months of the year accounts for this. The vegetables supplied are onions and potatoes. I think it extremely desirable that a ration of green vegetables in addition be sanctioned for the troops. When extra vegetables are issued, they usually consist of pumpkins, dil pussand, &c.; but what is required, from a dietetic point of view, is a ration of green vegetables, such as lettuces, cauliflowers, cabbages, or even bhâji. These should be in addition, and not in substitution, of the potatoes and onions already allowed.

It was pointed out many years ago by the Bombay Sanitary Commission that cases of scurvy are not uncommon among the troops in Málwa. One case of scurvy was, during the rains, admitted among the Lancashire Fusiliers; and when I was there in September I was so struck with the appearance of the men that by the kindness of Deputy Surgeon General Fraser I examined the regiment, and found that out of 626 men, 280, or 45 per cent., had swollen, spongy, and in some cases ulcerated gums. This condition I had been familiar with in the 98th at Karáchi, and I attribute it to a scorbutic taint, although I must bring to prominent notice that all the medical officers considered it to be due to malarial cachexia.

The milk supplied to the families and troops in barracks is obtained from gowlis who keep their milch cows and buffaloes principally in the village of Gowlipura on the west and also in another Gowlipura on the east which is outside the Cantonment limits. The stables are not clean, and the food supplied to the cattle is open to suspicion. At the hospitals the buffaloes are milked in presence of a patient.

Disease Statistics of European Troops.

The following returns compiled from the Vital Statistics of the European Army in India, lately published by the Statistical Officer to the Government of India, show the general statistics of sickness and mortality of the European troops occupying Mhow during the 10 years from 1870-79 :—

Aggregate Strength.	Average Number of Daily Sick for the 10 years.	Ratio per 1,000	Number of Daily Sick per 1,000 of Strength for 10 years.	Number of Deaths.	Died per 1,000 of Strength.	Admitted into Hospital per 1,000 of Average Strength.								Admission Rate per 1,000 of Strength.	Cause of Death in Hospital.							Wounds and Accidents.	Soldier Deaths and other Deaths out of Hospital.
						Cholera.	Enteric Fever.	Other Fevers.	Dysentery.	Diarrhœa.	Hepatitis.	Spleen Diseases.	Venereal Diseases.		Cholera.	Enteric Fever.	Malarial Fever.	Dysentery.	Diarrhœa.	Hepatitis.	Other Causes.		
13,270	898	67·8	67·8	155	11·68	1·1	2·5	752·7	21·6	44·9	58·2	19·8	305·9	1,630·4	10	26	15	7	1	21	56	5	14

The number of admissions into hospital in each month during the 10 years, with the principal causes, is given as follows :—

Causes of Admission.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total admitted during the 10 years.	Admitted per 1,000 of Strength.	Died out of each hundred Cases treated.
Dengue (of 1870)	..	..	..	..	..	..	..	..	..	6	5	..	11	0·8	
Cholera	..	..	3	1	1	..	..	19	..	..	..	..	15	1·1	66·67
Small-pox	..	1	1	..	..	..	..	..	..	..	..	..	2	0·2	
Enteric fever	2	2	3	3	4	3	1	4	10	9	4	2	47	3·5	55·32
Fever, intermittent	307	306	290	346	412	372	504	1,353	2,047	1,946	960	517	9,314	701·9	·02
Fever, remittent and continued	23	21	20	15	17	12	10	115	169	119	62	49	1,085	81·8	1·20
Apoplexy	..	4	1	7	4	11	3	4	3	3	3	1	40	3·0	97·50
Delirium tremens	5	3	1	5	5	3	6	3	10	3	3	4	49	3·7	8·04
Dysentery	13	11	28	20	17	20	26	54	30	34	27	14	296	21·6	2·43
Diarrhœa	34	39	54	34	37	30	77	111	52	50	43	35	502	44·9	0·17
Hepatitis	68	50	59	63	69	68	51	72	74	66	53	39	772	58·1	2·72
Spleen diseases	8	8	15	15	17	15	21	6	10	14	6	15	144	10·8	
Respiratory diseases	130	130	137	130	94	59	57	30	34	59	64	130	1,052	79·3	0·28
Phthisis pulmonalis	9	3	9	3	6	5	9	10	6	9	6	7	92	6·9	9·64
Scurvy	..	..	1	..	..	..	..	..	..	..	2	1	4	0·3	
Rheumatism	67	68	69	57	72	63	103	93	95	59	49	55	797	59·6	
Venereal diseases	253	253	211	261	262	236	243	199	191	205	193	202	2,710	204·0	
Eye diseases	33	39	32	45	38	16	24	25	22	20	24	25	284	21·4	
Abscess and ulcer	105	116	117	122	126	130	114	96	95	103	116	97	1,319	99·4	0·45
Wounds and accidents	127	125	120	147	146	100	126	93	89	106	101	106	1,445	108·1	
All other causes	212	168	162	190	217	155	254	219	207	204	190	188	2,366	179·0	
Total	1,408	1,362	1,342	1,466	1,523	1,255	1,731	2,325	3,069	3,206	1,957	1,557	22,409	..	..
	Admitted per 1,000 of average strength in each month.														
	109·5	103·1	106·4	122·1	121·9	100·2	137·6	176·0	239·4	226·2	147·9	121·7	1,630·4		

The following statements compiled from the "Vital Statistics" show the admission rate from the chief diseases at each of the 17 stations of the Bombay Command regarding which statistics are given, and will be found useful, as they afford a general comparison of the health of the troops at each station. A small detachment at Baroda from 1870 to 1875 is included in the statistics for Ahmedabad:—

Cholera.

	Stations.														Hill Stations.	
	Nimach.	Indore.	Ahmedabad.	Poona and Kirkee.	Nasirabad.	Sitára.	Ahmednagar.	Mhow.	Deesa.	Karáchi and Malir.	Bombay.	Belgaum.	Aden.	Ashgarh.	Hyderabad.	Mount Abu.	Perseedan.
Admission rate per 1,000 of average strength for a period of 10 years, 1870-79.	10·9	8·6	7·3	2·6	2·2	1·3	1·1	·7	·4					0		0	0

Enteric Fever.

	Stations.														Hill Stations.	
	Nasirabad.	Karáchi and Ghizri.	Nimach.	Ahmedabad.	Mhow.	Sitára.	Indore.	Deesa.	Ahmednagar.	Poona and Kirkee.	Hyderabad.	Ashgarh.	Aden.	Belgaum.	Bombay.	Mount Abu.	Perseedan.
Admission rate per 1,000 of average strength for a period of 10 years, 1870-79.	6·3	6·	5·4	5·1	3·5		3·2	3·	2·4	2·2	2·1	1·2	1·0		·8	4·7	2·5

Other Fevers.

	Stations.														Hill Stations.	
	Nimach.	Bombay.	Ahmedabad.	Nasirabad.	Hyderabad.	Mhow.	Ashgarh.	Karáchi and Ghizri.	Sitára.	Indore.	Poona and Kirkee.	Deesa.	Ahmednagar.	Aden.	Belgaum.	Mount Abu.	Perseedan.
Admission rate per 1,000 of average strength for a period of 10 years, 1870-79.	1302·7	1011·6	914·6	697·2	856·6	782·7	712·1	651·1	636·4	622·2	610·9	506·9	419·6	317·8	314·1	1,353·7	777·0

Dysentery.

	Stations.														Hill Stations.	
	Bombay.	Nasirabad.	Karáchi and Ghizri.	Aden.	Ashgarh.	Poona and Kirkee.	Nimach.	Hyderabad.	Mhow.	Deesa.	Sitára.	Ahmednagar.	Ahmedabad.	Belgaum.	Indore.	Mount Abu.	Perseedan.
Admission rate per 1,000 of average strength for a period of 10 years, 1870-79.	32·2	27·1	25·6	22·0	20·2	15·6	14·6	12·6	11·6	10·8	10·1	21·8	10·5		14·9	23·6	21·8

Diarrhœa.

	Stations.														Hill Stations.	
	Ahmedabad.	Nimach.	Karáchi and Ghizri.	Indore.	Nasirabad.	Bombay.	Poona and Kirkee.	Ahmednagar.	Mhow.	Ashgarh.	Aden.	Deesa.	Belgaum.	Hyderabad.	Sitára.	Mount Abu.	Perseedan.
Admission rate per 1,000 of average strength for a period of 10 years, 1870-79.	107·5	100·0	95·1	76·8	75·6	69·2	63·8	45·2	44·9	40·6	40·1	39·6	36·9	35·9	27·5	60·4	54·8

Hepatitis.

	Stations.															Hill Stations.	
	Bombay.	Mhow.	Nimach.	Nasirabad.	Deesa.	Ashgarh.	Aden.	Indore.	Ahmednagar.	Ahmedabad.	Sátára.	Poona and Kirkee.	Karáchi and Ghizri.	Belgaum.	Hyderabad.	Mount Abu.	Purandhar.
Admission rate per 1,000 of average strength for a period of 10 years, 1870-79.	59·4	58·2	55·4	55·4	42·8	39·4	30·3	33·1	30·8	29·0	27·5	27·0	25·6	20·1	17·5	48·6	49·7

Spleen Diseases.

	Stations.															Hill Stations.	
	Nasirabad.	Mhow.	Ashgarh.	Sátára.	Nimach.	Deesa.	Karáchi and Ghizri.	Poona and Kirkee.	Aden.	Ahmedabad.	Ahmednagar.	Bombay.	Hyderabad.	Belgaum.	Indore.	Mount Abu.	Purandhar.
Admission rate per 1,000 of average strength for a period of 10 years, 1870-79.	12·0	10·8	6·2	5·9	5·6	5·5	4·7		4·3	4·0	3·9	3·6	2·6	2·8	1·1	6·6	15

Venereal Diseases.

	Stations.															Hill Stations.	
	Sátára.	Indore.	Bombay.	Belgaum.	Nasirabad.	Poona and Kirkee.	Mhow.	Nimach.	Ahmednagar.	Ahmedabad.	Ashgarh.	Deesa.	Hyderabad.	Karáchi and Ghizri.	Aden.	Mount Abu.	Purandhar.
Admission rate per 1,000 of average strength for a period of 10 years, 1870-79.	319·7	274·3	239·9	235·4	216·7	210·5	205·0	204·5	194·8	163·1	158·9	137·3	143·7	101·6	86·8	203·0	190·2

Respiratory Diseases.

	Stations.															Hill Stations.	
	Nasirabad.	Mhow.	Indore.	Ashgarh.	Deesa.	Nimach.	Bombay.	Poona and Kirkee.	Karáchi and Ghizri.	Sátára.	Ahmedabad.	Hyderabad.	Ahmednagar.	Belgaum.	Aden.	Mount Abu.	Purandhar.
Admission rate per 1,000 of average strength for a period of 10 years, 1870-79.	97·6	79·2	76·8	75·6	70·1	67·8	59·8	59·2	57·1	56·8	55·9	48·6	45·2	40·3	65·3	99·4	

Phthisis Pulmonalis.

	Stations.															Hill Stations.	
	Indore.	Deesa.	Ashgarh.	Bombay.	Poona and Kirkee.	Sátára.	Aden.	Ahmedabad.	Mhow.	Karáchi and Ghizri.	Hyderabad.	Belgaum.	Nasirabad.	Nimach.	Ahmednagar.	Mount Abu.	Purandhar.
Admission rate per 1,000 of average strength for a period of 10 years, 1870-79.	20·5	10·6	9·9	9·5	8·0	7·6	7·0	6·6	6·3	5·7	5·8	4·9	4·7		1·9	4·7	30·6

All Causes.

	Stations.															Hill Stations.	
	Nimach.	Ahmedabad.	Bombay.	Nasirabad.	Mhow.	Indore.	Hyderabad.	Asirgarh.	Poona and Kirkee.	Karachi and Ghizri.	Sikára.	Deesa.	Ahmednagar.	Aden.	Belgaum.	Mount Abu.	Purandhar.
Admission rate per 1,000 of average strength for a period of 10 years, 1870-79.	2342·5	2044·6	2039·2	1897·5	1695·5	1613·7	1584·5	1580·0	1488·1	1471·4	1365·9	1229·7	1154·5	1046·0	1020·0	2032·7	2112·7

Daily Sick Rate.

	Stations.															Hill Stations.	
	Nimach.	Nasirabad.	Bombay.	Mhow.	Sikára.	Ahmedabad.	Poona and Kirkee.	Indore.	Karachi and Ghizri.	Belgaum.	Deesa.	Asirgarh.	Ahmednagar.	Hyderabad.	Aden.	Mount Abu.	Purandhar.
Average daily sick rate per 1,000 of strength for a period of 10 years, 1870-79.	74·2	69·5	69·2	66·8	60·2	58·9	55·9	54·4	51·5	51·7	50·0	49·3	48·9	48·1	37·0	55·2	56·1

Death Rate.

	Stations.															Hill Stations.	
	Nimach.	Ahmedabad.	Nasirabad.	Indore.	Deesa.	Karachi and Ghizri.	Bombay.	Aden.	Hyderabad.	Poona and Kirkee.	Sikára.	Mhow.	Asirgarh.	Ahmednagar.	Belgaum.	Mount Abu.	Purandhar.
Death rate per 1,000 of average strength for a period of 10 years, 1870-79.	29·11	28·88	23·73	20·28	17·55	16·37	13·53	14·29	12·23	11·91	11·71	11·68	11·00	8·62	7·76	19·64	8·48

The above tables, extremely valuable as they are for general comparison with other stations, do not, however, show the incidence of disease among the different corps which, for the period they embrace, formed the European garrison at Mhow, and I have, therefore, compiled from the records in the Surgeon-General's Office the following tables, giving the statistics of some of the chief diseases by corps since 1865 :—

Cavalry.

Year.	Corps.	Average Strength.	Cholera.		Enteric Fever.		Simple Continued Fever.		Febricula.		Intermittent Fever.		Remittent Fever.		All Fevers except Enteric.		Diarrhœa.		Dysentery.		All Causes.		Ratio per 1,000 or Average Strength.									
																							Cholera.		Enteric Fever.		All Fevers except Enteric.		Diarrhœa.		Dysentery.		All Causes.	
			A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
1865	H. M.'s 5th Dragoons	505	4	2	..	..	20	1	..	..	272	..	7	..	300	..	46	..	18	1	376	6	7·9	3·9	..	..	611·9	..	91·1	..	35·6	2·0	1,726·6	11·8
1866	H. M.'s 6th Dragoons	405	..	..	..	..	..	..	..	..	196	..	1	..	197	..	12	..	13	..	714	1	..	..	..	..	452·7	..	25·9	..	28·0	..	1,555·5	2·2
1867	2nd Dragoon Guards	25	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	1	..	12	1	..	..	..	..	..	..	57·1	..	28·6	..	342·8	28·6
	Eleventh Hussars	449	..	..	16	6	2	..	..	..	255	1	4	..	281	1	54	..	11	..	726	16	..	..	35·6	13·4	591·2	2·2	120·3	..	24·5	..	1,618·3	35·6
1868	H. M.'s 2nd Dragoons	296	1	1	..	..	2	..	..	..	114	1	6	..	123	1	3	..	19	..	456	5	3·3	3·3	..	..	310·6	3·3	12·0	..	48·0	..	1,151·5	13·3
1869	H. M.'s 2nd Dragoons	329	6	4	..	..	6	3	..	..	197	..	..	..	198	3	12	..	3	..	499	7	18·2	12·1	..	..	601·8	9·1	39·5	..	9·1	..	1,516·7	21·2
	15th The King's Hussars	15	..	..	..	..	1	..	..	..	..	..	..	..	1	..	..	..	1	..	11	..	..	..	..	..	200·6	..	..	..	66·8	..	733·3	..
1870	15th The King's Hussars	436	..	..	..	..	114	..	..	..	262	..	280	..	675	..	48	..	7	..	1,656	6	..	..	..	..	1,368·9	..	26·9	..	14·4	..	3,131·7	12·3
1871	15th The King's Hussars	483	..	..	..	..	..	..	..	..	215	..	15	..	230	..	41	..	..	..	931	5	..	..	..	..	1,027·3	..	34·9	..	..	..	1,927·3	10·3
1872	3rd King's Own Hussars	474	1	1	..	..	127	..	..	..	109	..	..	..	136	..	6	..	2	..	434	9	2·1	2·1	..	..	286·9	..	12·6	..	4·2	..	915·6	19·0
	15th The King's Hussars	440	2	1	..	..	3	..	..	..	260	..	4	..	270	..	..	..	..	..	474	8	4·5	2·2	..	..	834·5	..	..	..	..	..	1,077·3	18·2
1873	3rd King's Own Hussars	475	..	..	2	1	9	..	3	..	93	..	..	..	105	..	12	..	2	..	514	2	..	..	4·2	2·1	221·1	..	25·2	..	8·4	..	1,082·1	4·2
1874	3rd King's Own Hussars	494	..	..	7	3	105	..	1	..	127	..	..	..	260	..	28	..	3	..	551	6	..	..	14·2	6·1	532·4	..	56·7	..	6·1	..	1,152·1	12·2
1875	3rd King's Own Hussars	454	..	..	1	1	49	..	..	..	117	..	..	..	166	..	14	..	10	..	545	4	..	..	2·2	2·2	365·9	..	30·8	..	22·0	..	1,200·4	8·8
1876	3rd King's Own Hussars	443	..	..	5	2	49	..	..	..	71	..	..	..	114	..	17	..	16	..	623	6	..	..	11·3	4·5	257·5	..	38·4	..	36·1	..	1,406·9	13·5
1877	3rd King's Own Hussars	417	..	..	2	..	57	..	..	..	92	..	..	..	150	..	11	..	1	..	626	5	..	..	4·8	..	311·7	..	26·4	..	2·4	..	1,325·2	12·0
1878	3rd King's Own Hussars	390	..	..	6	5	33	..	..	..	197	..	1	..	231	..	21	..	8	..	743	6	..	..	10·3	7·7	592·3	..	79·5	..	20·5	..	1,906·1	15·4
1879	3rd King's Own Hussars	393	..	..	..	..	..	..	..	..	196	..	2	..	197	..	6	..	..	..	682	4	..	..	..	..	674·7	..	20·6	..	..	..	1,479·4	10·2
	17th D. C. O. Lancers	68	..	..	..	..	..	..	..	..	19	..	1	..	20	..	14	..	2	..	136	1	..	..	..	..	294·1	..	205·8	..	29·4	..	2,000·0	14·7
1880	17th D. C. O. Lancers	443	..	..	10	5	..	..	..	..	151	..	18	..	169	..	13	..	..	..	656	6	..	..	22·6	11·3	381·9	..	29·3	..	..	..	1,371·1	13·5
1881	17th D. C. O. Lancers	441	..	..	1	1	..	..	..	..	304	..	12	..	316	..	6	..	1	..	686	3	..	..	2·3	2·3	716·6	..	13·6	..	2·3	..	1,579·2	6·9
	Total	7,304	14	9	43	22	904	4	4	..	3,370	2	361	..	4,319	5	379	..	119	1	13,662	107	1·9	1·1	6·0	2·9	591·6	0·1	47·4	..	14·9	0·1	1,854·1	12·5

Artillery.

Year.	Corps.	Average Strength.	Cholera.		Enteric Fever.		Simple Continued Fever.		Febricula.		Intermittent Fever.		Indistinct Pyrexia.		All Fevers except Enteric.		Diarrhœa.		Dysentery.		All Causes.	
			A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
1865	D/E. B. H. Artillery	126	4	3	..	..	14	..	..	..	39	..	8	..	61	..	11	..	6	..	235	8
	21st Brigade R. A.	511	13	10	..	..	20	..	..	..	39	..	5	..	124	..	66	..	23	2	554	10
	Hd. Qr. No. 1 Battery 21st Brigade R. A.	131	..	..	..	..	2	..	..	..	48	..	4	..	58	..	5	..	2	..	149	..
1866	D/E. R. H. A.	124	1	1	..	..	4	..	..	..	42	..	2	..	68	..	10	..	..	..	216	1
	21st Brigade R. A.	443	..	..	..	..	25	..	..	..	122	..	..	..	138	..	49	..	3	..	560	3
	1/12th R. A.	40	..	..	..	..	..	..	..	..	66	..	..	..	66	..	8	..	1	..	117	1
1867	D/E. R. H. A.	122	..	..	..	..	3	..	..	..	28	..	..	..	31	..	2	..	1	..	124	1
	21st Brigade R. A.	397	..	..	..	..	9	..	..	..	60	..	..	..	75	..	13	..	..	..	369	4
1868	D/E. R. H. A.	109	..	..	..	..	7	..	..	..	32	..	..	..	39	..	1	..	..	..	108	2
	Hd. Qr. and 6/23 R. A.	62	..	..	..	..	..	..	..	..	10	..	..	..	10	..	1	..	2	..	48	1
1869	D/E. R. H. A.	122	3	1	..	..	..	..	..	..	176	..	..	..	176	..	8	..	1	..	295	3
	9th Brigade R. A.	399	..	..	..	..	43	..	14	..	305	..	50	..	305	..	19	..	16	..	685	16
1870	E Brigade R. H. A.	279	1	1	..	..	20	..	..	..	307	..	2	..	329	..	27	..	15	..	777	1
	Hd. Qr. D/E. R. H. A.	130	..	..	..	..	..	..	..	..	44	..	15	..	74	..	7	..	..	..	188	..
	No. 1/6 Brigade R. A.	98	..	..	..	..	2	..	..	..	108	..	1	..	111	..	1	..	..	..	221	2
1871	E Brigade R. H. A.	250	..	..	..	..	13	..	4	..	103	..	1	1	121	1	4	..	1	..	383	2
	E/D. R. H. A.	73	..	..	..	..	..	..	4	..	122	..	8	..	128	..	1	..	1	..	311	1
	Hd. Qr. and E/E. R. A.	106	..	..	..	..	4	..	29	..	44	..	1	..	44	..	1	..	1	..	154	1
	1/8 Brigade R. A.	78	..	..	..	..	..	..	1	..	46	..	..	..	46	..	6	..	..	..	104	2
1872	E/D. R. H. A.	102	..	..	..	..	..	..	..	..	163	..	19	..	182	..	19	..	..	..	302	..
	No. 2/6 R. A.	78	..	..	..	..	22	..	2	..	28	..	..	..	108	..	2	..	7	..	153	4
1873	E/C. R. H. A.	141	..	..	3	2	..	..	4	..	160	..	10	..	189	..	22	..	19	..	339	2
	No. 2/6 R. A.	74	..	..	..	..	6	..	1	..	58	..	2	..	67	..	7	..	11	..	151	2
1874	E/C. R. H. A.	157	..	..	1	..	..	..	1	..	139	..	..	..	140	..	3	..	3	..	301	..
	No. 2/6 R. A.	81	..	..	..	..	1	..	1	..	92	..	2	..	96	..	1	..	1	..	189	2
1875	E/C. Brigade R. H. A.	150	..	..	1	..	4	..	..	..	105	..	..	..	109	..	1	..	..	..	291	1
	No. 4/6 R. A.	82	..	..	..	..	3	..	..	..	74	..	..	..	77	..	10	..	4	..	177	3
1876	E/C Brigade R. H. A.	138	..	..	1	..	2	..	..	..	36	..	6	..	44	..	2	..	..	..	100	1
	No. 4/6 R. A.	80	..	..	1	..	1	..	1	..	44	..	1	..	47	..	2	..	..	..	111	1
1877	E/C Brigade, R. H. A.	101	..	..	..	..	1	..	7	..	77	..	..	..	85	..	6	..	..	..	203	..
	17/9th R. A.	61	..	..	..	..	2	..	2	..	9	..	..	..	12	..	1	..	2	..	70	..
1878	D/E. R. F. A.	158	1	1	..	..	..	..	..	..	77	..	321	..	398	..	8	..	..	..	483	1
	F/D. R. H. A.	102	..	..	..	..	2	..	1	..	132	..	1	..	103	..	1	..	1	..	236	1
	17/9 R. A.	61	..	..	..	..	..	..	..	..	28	..	..	..	28	..	6	..	5	..	147	..
1879	D/B. R. H. A.	157	..	..	..	..	..	..	..	..	244	..	59	..	300	..	7	..	1	..	440	1
	17/9 R. A.	84	..	..	..	..	..	..	..	..	68	..	1	..	69	..	5	..	2	..	171	..
1880	D/B. R. H. A.	160	..	..	..	..	..	..	..	..	90	..	1	..	97	..	2	..	2	..	174	6
	17/9 R. A.	87	..	..	..	..	3	..	2	..	62	..	..	..	67	..	..	..	1	..	151	..
	5/11 R. A.	14	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15	..
1881	D/B. R. H. A.	178	..	..	..	..	..	..	..	..	69	..	..	..	69	..	2	..	18	..	190	..
	5/11 R. A.	89	..	..	..	..	..	..	1	..	16	..	..	..	17	..	..	..	..	..	97	..
	Total	6,490	31	17	7	2	303	..	33	..	3,690	..	345	1	4,358	1	290	..	103	2	10,236	80

Year.	Ratio per 1,000 on Average Strength.									
	Cholera.		Enteric Fever.		All Fevers except Enteric.		Diarrhœa.		Dysentery.		All Causes.	
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
1865	31·7	23·8	..	..	484·1	..	87·3	..	47·6	..	1,865·1	63·5
	21·6	20·0	..	..	242·7	..	130·9	..	44·0	3·9	1,097·1	39·1
	..	..	..	..	442·7	..	38·2	..	22·9	..	1,115·7	..
1866	8·1	8·1	..	..	548·4	..	80·6	..	..	..	1,693·5	8·1
	..	..	..	..	310·1	..	110·1	..	6·7	..	1,266·7	6·7
	..	..	..	..	566·0	..	23·6	..	19·2	..	1,171·7	19·2
1867	..	..	..	..	252·0	..	16·3	..	8·1	..	1,008·4	8·1
	..	..	..	..	189·9	..	30·3	..	..	..	773·9	10·1
1868	..	..	..	..	357·8	..	9·2	..	..	..	1,541·3	18·2
	..	..	..	..	158·7	..	15·9	..	31·7	..	761·9	15·9
1869	24·6	8·2	..	..	1,442·6	..	65·6	..	8·2	..	2,401·6	24·6
	..	..	..	..	904·9	..	126·5	..	48·6	..	1,760·9	41·1
1870	1·7	1·7	..	..	368·2	..	46·6	..	23·9	..	1,342·9	1·7
	..	..	..	..	266·3	..	160·9	..	46·7	..	1,126·7	..
	..	..	..	..	1,261·4	..	11·4	..	..	..	2,251·4	21·7
1871	..	..	..	..	467·2	3·9	15·4	..	3·9	..	1,092·7	11·5
	..	..	..	..	1,753·4	..	109·6	..	13·7	..	4,260·3	13·7
	..	..	..	..	396·1	..	6·6	..	6·6	..	967·7	6·6
	..	..	..	..	615·4	..	76·9	..	..	..	1,333·3	25·6
1872	..	..	..	..	970·2	..	77·4	..	..	..	1,797·6	..
	..	..	..	..	1,320·5	..	25·6	..	89·7	..	1,948·7	51·3
1873	..	..	21·3	14·2	1,332·3	..	156·0	..	134·8	..	2,397·2	21·3
	..	..	..	..	950·4	..	94·0	..	148·0	..	2,151·6	67·0
1874	..	..	6·4	..	891·7	..	19·1	..	19·1	..	1,929·9	..
	..	..	..	..	1,152·2	..	..	..	24·7	..	2,469·2	24·7
1875	..	..	6·5	..	712·4	..	..	..	..	..	1,993·0	6·5
	..	..	..	..	927·7	..	120·5	..	49·2	..	2,132·5	36·1
1876	..	..	7·2	..	318·8	..	14·5	..	..	..	1,376·8	7·2
	..	..	12·5	..	587·0	..	37·5	..	..	..	1,387·5	12·5
1877	..	..	..	..	397·0	..	31·2	..	..	..	1,757·7	..
	..	..	..	..	148·1	..	12·3	..	24·7	..	864·2	..
1878	6·5	6·5	..	..	1,886·1	..	50·6	..	..	..	3,056·9	6·5
	..	..	..	..	1,062·2	..	6·2	..	6·2	..	2,061·7	6·2
	..	..	..	..	329·6	..	29·6	..	58·8	..	1,717·4	..
1879	..	..	..	..	1,979·6	..	46·6	..	6·4	..	2,934·3	6·6
	..	..	..	..	821·4	..	58·5	..	23·8	..	2,033·7	..
1880	..	..	..	..	870·0	..	30·0	..	30·0	..	1,740·0	60·0
	..	..	..	..	770·1	..	11·5	..	11·5	..	1,735·6	..
	..	..	..	..	..	..	..	..	..	..	1,071·4	..
1881	..	..	..	..	339·0	..	15·7	..	140·6	..	1,351·6	..
	..	..	..	..	164·9	..	..	..	..	..	969·4	..
	11·2	2·6	1·4	0·3	652·7	0·3	58·6	..	29·6	0·3	1,574·1	12·3

Infantry.

Year.	Corps.	Average Strength.	Cholera.		Enteric Fever.		Simple, Continued Fever.		Febricula.		Intermittent Fever.		Remittent Fever.		All Fevers except Enteric.		Diarrhœa.		Dysentery.		All Causes.	
			A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
1866 ..	103rd Regiment	903	12	8	..	..	15	..	..	..	1,060	..	54	..	1,110	..	109	1	21	..	1,313	22
1866 ..	H. M.'s 104th Fusiliers	805	..	..	..	..	1	..	..	..	686	1	5	..	692	1	76	..	14	..	1,260	12
1867 ..	H. M.'s 95th Foot	813	1	1	1	..	2	..	..	..	659	..	..	..	661	..	39	..	33	..	1,281	8
1868 ..	H. M.'s 95th Regiment	727	..	..	1	1	..	..	..	..	180	..	..	..	180	..	25	..	2	..	699	8
1869 ..	H. M.'s 95th Regiment	721	10	7	..	..	4	..	9	..	727	..	2	..	742	..	79	..	7	..	1,378	16
1870 ..	H. M.'s 99th Regiment	609	..	..	..	..	..	..	502	..	510	1	101	1	913	2	42	..	20	..	1,584	8
1871 ..	H. M.'s 99th Regiment	927	..	..	4	2	29	..	64	..	862	..	10	..	966	..	62	..	29	..	1,050	12
1872 ..	H. M.'s 99th Regiment	921	5	5	1	..	..	..	..	..	530	..	35	..	567	..	25	..	12	..	1,172	15
1873 ..	H. M.'s 99th Regiment	925	..	..	..	..	1	1	..	..	281	..	5	..	286	..	34	..	7	..	950	12
1874 ..	H. M.'s 99th Regiment	796	..	..	2	2	2	..	..	..	287	..	11	..	300	..	17	..	..	..	967	5
1875	99th Regiment	886	11	7	1	..	2	..	13	..	425	..	5	..	445	..	32	..	35	..	1,174	18
	Detachment 108th Regiment ..	69	..	..	..	..	1	..	..	..	7	..	..	..	8	..	2	..	2	..	69	..
1876 ..	H. M.'s 2/17th Regiment ..	101	..	..	1	..	1	..	5	..	8	..	1	..	15	..	5	..	..	..	101	1
1877 ..	H. M.'s 2/17th Regiment ..	956	..	..	2	1	10	..	43	..	306	..	2	..	378	..	28	..	14	..	1,328	7
1878	1/2nd Queen's Regiment ..	810	2	2	1	..	..	..	2	..	590	..	20	..	631	..	1	..	1	..	1,338	19
	2nd Battalion 17th Regiment ..	649	..	..	6	6	..	..	..	..	670	..	5	..	684	..	32	..	6	1	1,551	12
1879	H. M.'s 2nd Queen's Regiment..	706	..	..	..	..	..	..	1	..	40	..	..	..	50	..	1	..	..	..	136	..
	H. M.'s 25th Regiment	705	..	..	1	1	11	..	73	..	1,340	..	7	..	1,437	..	66	..	5	..	2,033	7
1880	H. M.'s 28th Regiment	870	..	..	6	2	19	..	82	..	1,595	..	31	..	1,763	..	64	..	7	..	2,564	10
	Depôt 61st Regiment	171	..	..	3	2	3	..	1	..	116	..	..	..	122	..	9	..	2	..	214	2
1881	1st Battalion Worcestershire Regiment	685	..	..	1	1	8	..	..	..	466	..	..	..	468	..	33	..	2	..	1,096	4
	2nd Battalion Lancashire Regiment	585	..	..	1	..	28	..	..	..	14	..	..	..	43	..	..	..	14	..	227	..
	Depôt 2nd Gloucester Regiment	146	..	..	2	2	8	..	..	..	332	..	1	..	349	..	..	..	..	..	459	2
	Total ..	14,914	42	31	35	30	155	..	895	..	11,768	2	359	1	12,759	2	781	1	329	1	24,764	192

Year.	Ratio per 1,000 on Average Strength.											
	Cholera.		Enteric Fever.		All Fevers except Enteric.		Diarrhœa.		Dysentery.		All Causes.	
	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.
1866 ..	13·6	8·4	..	..	1,174·2	..	134·4	1·0	22·0	..	1,907·7	23·1
1866 ..	..	..	..	..	772·2	1·1	84·9	..	13·6	..	1,407·8	12·5
1867 ..	1·2	1·2	1·2	..	807·1	..	47·6	..	23·1	..	1,564·1	9·8
1868 ..	..	..	1·4	1·4	247·6	..	34·4	..	2·8	..	961·5	11·0
1869 ..	13·7	9·6	..	..	1,025·9	..	108·1	..	9·6	..	1,885·1	21·9
1870 ..	..	..	..	..	1,613·5	2·2	46·7	..	22·2	..	1,736·6	8·9
1871 ..	4·2	2·1	..	..	1,042·1	..	66·9	..	31·2	..	1,780·0	12·9
1872 ..	5·6	5·6	1·1	..	626·6	..	29·3	..	13·5	..	1,311·4	16·9
1873 ..	..	..	..	..	308·0	..	36·7	..	7·5	..	1,016·9	12·9
1874 ..	..	..	2·5	2·5	309·0	..	21·4	..	..	..	1,089·2	6·2
1875	12·4	7·9	1·1	..	502·3	..	36·9	..	39·5	..	1,325·1	20·3
	..	..	..	..	127·0	..	31·7	..	31·7	..	902·4	..
1876 ..	..	..	..	..	149·5	..	49·5	..	..	..	1,000·9	9·9
1877 ..	..	..	2·1	1·2	432·2	..	32·7	..	16·9	..	1,454·6	8·3
1878	3·0	2·0	..	..	1,337·2	..	2·0	..	2·0	..	2,466·7	19·6
	..	..	9·2	9·2	1,053·9	..	49·3	..	9·2	1·5	2,439·1	18·4
1879	..	..	..	..	471·7	..	9·4	..	..	..	1,351·9	..
	..	..	1·4	1·4	2,689·3	..	90·9	..	7·1	..	3,872·3	9·9
1880	..	..	6·9	2·3	2,018·3	..	73·1	..	8·0	..	2,929·9	..
	..	..	17·5	11·7	713·4	..	29·6	..	49·9	..	1,251·4	11·7
1881	..	..	1·5	1·5	722·3	..	48·5	..	7·9	..	1,611·8	5·9
	..	..	1·7	..	73·9	..	..	..	24·1	..	390·9	..
	..	..	13·7	13·7	1,543·6	..	..	..	..	..	2,142·6	29·5
	Total ..	..	2·3	1·2	855·5	0·2	32·4	0·1	15·2	..	1,689·6	12·9

The above tables embrace a period of 17 years, and show that the corps living in each set of barracks have suffered from disease in very different proportions, as will appear from the following statement :—

Disease.	Ratio per 1,000 of Average Strength, 1863-81.		
	Cavalry.	Artillery.	Infantry.
Cholera	1·8	3·2	2·8
Enteric fever	6·0	1·1	2·3
All other fevers	565·2	653·7	855·5
Diarrhœa	47·4	58·6	52·4
Dysentery	14·9	25·0	15·3
All causes	1,584·1	1,578·1	1,659·8

During the period the Artillery have suffered from cholera to a much greater extent than either the Cavalry or Infantry ; but it must be remembered that out of the 21 admissions and 17 deaths from this disease among the Artillery, 11 admissions and 10 deaths occurred in the 21st Brigade R. A. in 1865, the year of celebrated cholera march.

Mhow is not a station where cholera has prevailed to any great extent, and a reference to a former table will show that it occupies a comparatively low place in the list. This is in marked contrast to the neighbouring Cantonment of Indore, which stands second. According to the figures shewn in the Vital Statistics during the ten-year period there were 15 admissions which took place in the following months :—Three in April, one in May, one in June, and ten in August.

Enteric fever next claims attention, and the much higher ratio among the Cavalry is at once apparent. Recent arrival in the country as well as youth are, as is well known, the two great predisposing causes of enteric fever ; but the exciting causes, in my opinion, depend, as regards Mhow, on local insanitary conditions as well as on climatic causes.

One of the principal exciting causes has already been pointed out by the Army Sanitary Commission, and is ascribed to impure water. As regards the Cavalry, it will be remembered that the source of drinking water is situated on a lower level than the inhabited area and below a site previously occupied for a long series of years by a Native Infantry Regiment, whilst the nála passing it must convey from the higher level all kinds of impurity from a gathering ground which at all times must be extremely difficult to keep clean.

As before expressed, I consider wells Nos. 14 and 15 suspicious sources of drinking water for the Cavalry, and I recommend that they be no longer used as such, but if the servants' houses and the objectionable privy in the Library compound were removed that the drinking water be procured from well No. 22.

The other measures regarding drinking water for the troops, which I consider necessary, have been already stated.

Another exciting cause is, in my opinion, to be found in the insanitary conditions which will be described when I speak of the Sadar Bázár. The soldier in too many instances spends most of his spare time in the bázár and in the prostitutes' houses which are situated in a most filthy part of it. He remains for hours in a brothel, lying perhaps within a few feet of an uncleaned privy or an equally dirty cesspool, and in any case close to ground which is filth-sodden.

If he wants to quench his thirst there he can only procure water, as shown by the analyses, of a most impure character ; and if he buys from a shop of a respectable vendor he can only obtain beverages which have been concocted with impure water. When he goes for a walk into the country, and drinks from a well in any of the surrounding villages, he is equally exposed to danger.

I also regard malaria and dampness in the sub-soil as exciting causes; and a careful study of the accompanying tracing which Major Gibbs, the Executive Engineer, has been good enough to prepare for me, showing the relative dampness of the sub-soil in various parts of the Cantonment, is most instructive.

Major Gibbs says:—

"As the diagram will sufficiently explain the condition of the sub-soil, I will only observe that in all cases, except one, the surface soil retained moisture longest. The exception is in the case of No. 1 Cavalry barrack, the northernmost of all the European barracks. The ground slopes eastward from that barrack to the trial pit, and was, therefore, sheltered to a great extent from the drying effects of the prevailing south-westerly wind during the months of September and October; but I cannot account for the dampness of the rock, unless it be merely due to the trickling of the water down the sides of the pit from the overlying softer soil. It may be assumed in all cases that very little water actually sinks into the rocky substratum through fissures."

These diagrams prove conclusively how long a sub-soil will remain damp even in such an elevated position as the trial pit near No. 1 Cavalry barrack, where one would naturally have supposed it would have become dry sooner than at a lower level, and they also show how dangerous a solid plinth made of rammed earth must always be, and the necessity for having the floor of a barrack separated from the ground by a clear air space of not less than 3 or 4 feet.

It would have been most interesting to have known the particular barracks from which cases of enteric fever were admitted; but in Mhow, as in other stations, this most necessary information has not been kept. I particularly wished to see whether the new Cavalry barracks—which were built, it will be remembered, over a site formerly occupied by a Native Infantry Regiment—have been more unhealthy than the older barracks on the top of the hill.

I am also unable to show the monthly distribution before 1876, as such information is not obtainable from the records in the Surgeon-General's Office. I have, therefore, compiled, from the form introduced by the Sanitary Commissioner, the following statement:—

	January.	February.	March.	April.	May.	June.	July.	August.	Sept.	October.	Nov.	Dec.	Year.
1876 ...	...	...	...	2	1	2	...	...	3	...	...	...	8
1877 ...	1	1	...	...	...	1	...	...	1	...	...	...	4
1878 ...	...	...	...	...	...	...	...	2	3	4	1	1	11
1879 ...	...	...	...	...	...	...	...	...	...	...	1	...	1
1880 ...	...	...	2	6	5	...	...	...	...	2	2	2	19
1881 ...	1	1	1	...	...	...	...	1	...	1	...	...	5
1882 ...	...	...	...	...	...	...	...	...	...	1	...	...	1
Total ...	2	2	3	8	6	3	..	3	7	8	4	3	49

It will be thus seen that during the 7 years no admission took place in July, and the table bears evidence that more than one cause operates in producing this disease.

There is no record of the ages, total service, or service in India of all the men admitted into hospital with enteric fever, but the following tables supply this information regarding the men who died between the years 1871-82:—

Ages in years.	19	20	21	22	23	24	25	26	27	28	29	30	Above 30	Total.
Cavalry	...	2	...	3	...	3	1	1	3	...	...	...	3	16
Artillery	...	...	1	...	...	...	...	1	...	...	...	...	...	2
Infantry	1	3	3	1	4	2	3	...	1	...	...	...	...	20
Total	1	5	4	4	4	5	4	2	4	..	..	..	3	38

So that 25 of the 38 deaths occurred in young men under 25 years of age, and this proves that youth is one of the great predisposing causes of the disease.

The total service of these men was as follows:—

Total Service.	Months.		Years.															
	Under 6	Over 6 and under 12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total.
Cavalry ...	...	1	...	1	1	2	1	...	3	...	2	2	1	...	...	...	...	1	1	16
Artillery ...	...	...	...	...	1	...	...	...	1	...	...	...	...	...	...	...	...	...	...	2
Infantry ...	...	...	...	4	3	6	4	1	...	1	...	...	...	1	...	...	...	...	...	20
Total ..	1	...	...	5	5	8	5	1	4	1	2	2	1	1	...	...	...	1	1	38

Their Indian service being shown in the next statement:—

Indian Service.	Months.		Years.											
	Under 6	Over 6 and under 12	1	2	3	4	5	6	7	8	9	10	Over 10	Total.
Cavalry	4	4	1	2	1	...	3	...	...	...	1	...	...	16
Artillery	2	...	...	...	...	...	...	...	...	...	...	...	...	2
Infantry	5	1	12	2	...	...	...	...	...	...	...	...	...	20
Total ...	11	5	13	4	1	...	3	...	...	...	1	...	...	38

This table forcibly illustrates the second great predisposing cause, *viz.*, recent arrival in the country, as 29 out of the 38 men had not been 2 years in the country when they succumbed.

The table on page 34 brings out very clearly the fact that the troops on the south of camp suffer more severely from malarial fevers than those further north. The ratio per 1,000 of average strength for each arm is as follows:—

Infantry.	Artillery.	Cavalry.
855·5	653·7	565·2

It has long been remarked that the Native troops, whose lines are sheltered by the hill from the prevailing wind during and after the rains, suffer less than the European troops on the more exposed sites.

I have again to lament the absence of any record regarding the disease statistics of particular barracks, which would have afforded me the greatest possible assistance in the enquiry into the prevalence of malarial fevers.

In my opinion the most fruitful source of malaria in Mhow is the marshy and water-logged condition of the valley on the south and south-west of the station. This is the source which principally affects the Infantry and Artillery, whilst the undrained condition of the ground on each side of the Gumbir River affects the Cavalry.

As regards the Infantry, I am informed that No. 4 and No. 5 E. I. barracks have always had an unenviable notoriety as being more unhealthy than the barracks on the top of the hill.

This might be expected from their closer proximity to the malaria-producing cause. But, besides those I have named, there are other causes in operation in producing malaria in Mhow. The barracks stand on ground through which during the rains there is a continuous movement of water down to a lower level. They all have solid plinths; and not only does damp arise from the ground, but they are rendered still more unhealthy by the rain beating into the verandahs, whilst the roofs leak. Such conditions are alone sufficient to induce sickness.

It is an extremely difficult matter to recommend any course which would be financially possible to remedy all the malaria-producing causes, and the difficulty is enhanced by the fact that the valley is in foreign territory. Perhaps the Darbár might be induced to consent to plant trees thickly all over the area, and to permit main lines of deep earth trenches to be cut at intervals down to the nalás which form the head-waters of the Satia River; but further action is required in and around the barracks themselves. To render them healthy I can only say that a system of sub-soil drainage is necessary. This applied over such large areas would, of course, entail a large expenditure, and under present circumstances is probably financially impossible; but I would suggest that, at all events, the sub-soil water from the upper levels be cut off from some of the barracks—for example, Nos. 4 and 5 in the E. I. Lines; Nos. 3, 4 and 5 in the Cavalry Lines, and from the barracks occupied by the Heavy Battery. This might be effected by cutting trenches some 6 or 8 feet deep along their upper frontages and cementing the side towards the barrack, the trench itself being filled with sand or other loose material, with the object of preventing the soil water from passing under the ground on which the barracks stand.

The floors of all barracks should have air perflation beneath them, as so long recommended by the Army Sanitary Commission; but as this cannot now be adopted, the next best thing, as pointed out by it, is to dig out the material forming the floor, and cover it for a certain depth with a thick layer of concrete. The practice that obtains in some corps, of sluicing stone barrack floors with water, is most objectionable, and should not be allowed, as sweeping with a brush is all that is required for cleanliness.

Then, again, the roofs ought to be so constructed that no rain could leak through them into the barrack rooms and verandahs, and the arches in the verandahs should be efficiently protected from rain beating in.

The wastage water from cook and ablution rooms ought, in my opinion, to be carted away, unless it can be made to convey itself through an impervious channel to a safe distance from the barracks and wells. This, it is feared, cannot be done until a more ample water-supply is provided.

These measures seem to me to be imperatively demanded, for I cannot exaggerate the danger of dampness either in the soil or in the barracks. There is also a nuisance which I have noticed in most barracks in the Presidency which might at once be stopped. I allude to the damp condition of the floors below the Macnamara filter tubs. To remedy this a simple platform of impervious material for the tub to stand on, and a pipe to convey wastage water to a downtake, is all that is required.

The very high admission rate among the Artillery for diarrhœa and dysentery points, in my opinion, to impure water.

Mhow cannot be described as a very healthy station for European troops; for, as will be seen by the preceding tables, there are only four stations in the plains with a higher admission rate, whilst the daily sick rate is equally high. In it, too, is found a very high admission rate for the following complaints:—hepatitis, diseases of the spleen and of the respiratory organs.

The death-rate, however, in Mhow is, comparatively speaking, low, as it is fourth in the list of lowest death-rates.

It would, in my opinion, be a great advantage if the Cavalry regiment now stationed at Mhow was, if not permanently, at least for the first 3 years of residence in the country, transferred to Ahmednagar, where not only the death-rate, but the admission rate is much lower, and which is, in fact, the second healthiest station in the Presidency. Political reasons may perhaps be urged against this transference; but it is hoped that health considerations may be allowed to prevail, especially in these days when there is through railway communication between the two stations.

Native Infantry Lines.

There are lines for 2 Native Infantry regiments situated on the north of camp. The black cotton soil immediately adjoins the pendalls, and the drainage is only surface. The pendalls are according to the standard number, and for many years they have been condemned as utterly bad; and, indeed, it would be difficult to find worse in any Cantonment in the Bombay Command. Surgeon Dane, the Medical Officer of the 1st Grenadiers, in his sanitary report for 1881 says:—

"The lines are in most ruinous condition, and in the rains would be dangerous for habitation, as they are in a very tumble-down condition."

Colonel Anderson, the Commandant of the Grenadiers, has during 1882 rebuilt 18 out of the 32 pendalls belonging to this regiment. He has filled in the floors, and provided a plinth, raised the roof, and left an opening along the verandah wall. This is a great improvement, for in the old lines "there is no plinth, and in fact in many of the huts the floors are actually lower than the roadway".

The usual defects of Native Infantry lines, however, remain. Children are allowed to defœcate in front of the married quarters, and there is the náni inside the verandah. "The drains are simply little trenches which run into main drains, also open, alongside of the main streets. They are none of them tiled or in any way pucca, and the water simply soaks into the ground", whilst the latrines are 300 yards to the north of the lines—2 being for men and 1 for women. This, in my opinion, is too far away; and at my visit the ground in some of the cross streets was found to have been fouled by the men, not only with urine, but by nightsoil.

I think the existing arrangements in force in Native Infantry lines are open to great improvement. In the first place I wish the recommendation made by the Poona Committee, of having all unmarried men quartered in barracks instead of in huts, had been carried out; as, in my opinion, the dark, badly ventilated rooms which the sepoys of the Native Army inhabit, together with the insanitary conditions of the lines, are among the most fruitful causes of disease from which the Native Army suffers.

It is impossible that proper buildings can be erected with the present amount of hutting money allowed by Government; and the sepoys are under such heavy deductions of pay on account of necessaries that they cannot reasonably, I would respectfully submit, be compelled to provide suitable buildings; but if Government would build permanent barracks on well-raised plinths, and sub-soil drain the lines, the sepoys might perhaps be called upon to find the labour, &c.

I think the latrines are too far off the lines. It is not to be expected that the men, and especially the women, will go for such long distances after nightfall. In my opinion, Goodfellow's pattern latrines might be erected with safety in much nearer proximity, and I think there should be a urinal at the head of every line and an enclosed bathing place for the women and children on selected sites. It is very necessary for health that the men should sleep on cots; but it is hard to expect the men to provide them if, when ordered on service, as occurred the other day in the 12th Regiment, they are obliged to sell them at a very considerable loss. Dr. Dane says:—

"The Regimental Hospital is a very fine building of stone and brick, with a good plinth and ample accommodation. There are 2 large central wards with 4 large verandahs and 4 small rooms at the corner used as offices, dispensary, &c. There is a separate hospital with 2 wards for the treatment of infectious cases."

The drinking water-supply is derived from wells which have been already described.

The Ordnance Lines for lascars employed at the Arsenal are situated on the south of the Fort on high ground over and between 2 nálas. They consist of 2 rows of thatched huts with mud walls. They are wretched places; the latrine is at some distance on the west across the nálá to the south, which during heavy rain overflows; at such times and even during the fair weather the bank of the nála below the huts is used as a place of natural resort.

The well from which these lascars draw their water, is situated over the nála to the north of the lines, and at a safe distance from the latrine.

I find that it is not possible for a lengthened period to extract from the annual returns of the Native Army the disease statistics pertaining to the Native troops who have been stationed in Mhow, as they include detachments at Indore and in some years at Asirgarh also.

I have, therefore, compiled from Sanitary Form C the returns of each Native regiment for each year since 1877. In Mhow, as in other stations, malarial fevers have caused the largest number of admissions; and these, as usual, prevail chiefly during the months of August, September and October, and these diseases will, in my opinion, continue to prevail until the lines are re-constructed on proper principles and until the site is provided with sub-soil drains.

I am confident that local conditions in the immediate vicinity of the lines and huts are the most fruitful sources of disease among the Native Army, for no body of men can retain health and vigour who live on an undrained site in badly ventilated, damp and dark rooms, and who often stint themselves as regards food.

If an experiment were ordered to be made with the view to the employment of Native soldiers in digging trenches for sub-soil drains in and about their lines, it would not only afford an excellent opportunity of teaching them the use of the pick and shovel, which could not fail to be of the utmost value as an essential part of their military training, but it would, I am confident,—supposing, of course, that they had been properly housed,—be attended with a very marked diminution of disease.

Year.	Corps.	Average Strength.	Cholera.		Enteric Fever.		Intermittent Fever.		Remittent Fever.		All Fevers.		Diarrhœa.		Dysentery.		All Causes.		Ratio per 1,000 on Average Strength.	
			A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	A.	D.	All Fevers.	All Causes.
1877	Her Majesty's 22nd Regiment N. I.	490	..	..	..	..	798	..	2	1	800	..	10	..	7	..	829	3	612·3	1,269·7
	Her Majesty's 25th Regiment N. L. I.	430	..	..	..	..	271	..	1	..	272	..	18	..	11	..	602	2	632·6	1,402·6
1878	Her Majesty's 6th Regiment N. L. I.	429	..	..	..	..	360	4	2	1	310	5	16	..	10	..	511	6	734·3	1,190·9
	Her Majesty's 22nd Regiment N. L. I.	557	1	1	..	..	427	1	1	1	430	..	24	..	21	..	751	8	780·4	1,348·3
1879	Her Majesty's 6th Regiment	521	..	..	..	..	478	..	1	..	479	..	21	..	2	..	801	1	929·4	1,537·4
	Her Majesty's 13th Regiment.	294	..	..	..	..	411	1	1	..	412	..	7	..	4	..	716	4	1072·9	1,949·9
1880	1st Grenadier Regiment N. I.	516	..	..	..	..	91	..	1	..	92	..	..	..	..	..	59	1	146·6	2,457·1
	Her Majesty's 6th Regiment N. I.	321	..	..	..	..	71	..	..	..	71	..	4	..	1	..	109	..	307·2	4,179
1881	Her Majesty's 1st Grenadier Regiment N. I.	553	..	..	..	..	213	..	6	1	227	..	4	..	5	..	694	4	392·4	1,149·9

For December only.

Conservancy and Sanitary Condition of Regimental Lines, &c.

The conservancy establishment for regimental lines is as follows :—

Conservancy Serjeant.	Head Mukádam.	Second Mukádam.	Sweepers.	Carts.	
				Dry Refuse.	Nightsoil.
1	1	1	24	7	8

This establishment removes the dry sweepings, stable litter, as well as night-soil from the compounds of all officers and civilians living outside the bázár and within Cantonment limits, including the Native Infantry, Ordnance and Commissariat Lines. The service is, as a rule, well performed, but I think the dwellings and the privies of the native servants require much more supervision. And more attention should, in my opinion, be paid to the disposal of liquid filth from

the cook-rooms, whilst the surface conservancy in many of the officers' compounds appeared to me also to require more attention.

The Mall and one or two of the streets are lighted with kerosine oil lamps; but as the roads in camp are not watered, clouds of dust are blown about during the fair weather, which is very prejudicial to health. The insufficiency of the present water-supply prevents the Cantonment Committee from taking this very desirable action.

The nightsoil from the barracks, &c., is taken to a waste place near one of the main drainage nálás and situated on the confines of the Cantonment and to the south-west of the village of Gujia Khera, from which it is about 500 yards distant. It until recently was buried in separate trenches by the regimental establishment of each corps. Lately the poudrette system has been introduced; but as no supply of ashes of burnt town sweepings is available, earth is used instead, and not in sufficient quantity, for there was what I can only describe as a most atrocious stink at the time of my visit. It appears to me that there can be no sufficient reason why there should be two places for the deposit of nightsoil, *viz.*, one for the troops and another for the Sadar Bázár. In my opinion all the nightsoil from the Cantonment should be taken to one place where it should be dealt with; and there also appears to be no sufficient reason why because an establishment of beldárs, &c., is kept up for each corps, the nightsoil of all the corps should not be treated collectively instead of regimentally, as was the case when the trench system was in force. I believe a saving to Government would result if the regimental beldárs were discharged and only a sufficient number kept to perform the work at the manure yard; I also think the present site objectionable as being to windward of the village of Gujia Khera, and it is also in much too close proximity to some of the wells from which the villagers draw their water.

Grass is allowed to grow during the rains in the compounds of officers in the Cantonment; but as this practice keeps the sub-soil wet it is, in my opinion, open to objection.

The Government garden was, during September, in parts marshy and covered with coarse rank vegetation. This should, I think, be kept regularly cut during the rains, and part of this compound badly requires draining; water was found within a foot of the surface in some wells on the road leading past the gardens.

It has been decided by order of the Cantonment Committee that, instead of walls round the boundaries of officers' compounds, there should be a ditch, 3 feet deep by 4 feet wide, and several such have been made. I have found some of these ditches used as places of natural resort by natives, and have seen dirty pieces of paper, rags, &c., lying in them, and am sure they add to the insanitary conditions already existing, and, therefore, recommend that the order be rescinded, and a low wall be substituted. I am glad to notice, as the Cantonment from the want of road-side trees looks bare, that attention is paid to their cultivation, as 636 were planted during 1881.

The country outside Cantonment limits being foreign territory, and consequently not under the control or supervision of the Cantonment authorities, adds much to the liability of the British soldier to catch disease; but it is a matter of surprise that the native village of Pensionpura should ever have been allowed to have been established within the Cantonment, and especially in the position it occupies, as it is only 600 yards to the west of the Cavalry barracks. I quite allow that great care is taken to keep it as clean as possible; but filth is inseparable from such places, and I think it should, if possible, be removed. The water from a well in it contained as much as 70 grains of total solids and the very large amount of 8·36 grains of chlorine per gallon.

There is a piggery establishment here, which is kept clean, and the pigs are said to be gram fed; but although by far the best I have seen in this country the danger of eating unsound or diseased or unclean pork is so great that I do not think it should be allowed, and I recommend that the most stringent orders be issued to prevent any pork at all being brought into the Cantonment.

The Sadar Ba'za'r.

The Sadar Bázár is situated on the east of the Cantonment, below the Protestant church and the Staff Lines, on ground sloping down to the nála previously described and the Satia River. It covers an area of about 240 acres, and is bounded on the south by the road leading to the railway station and past the Government gardens and Engineer's stores, on the west and north by roads dividing it from the Staff Lines and officers' compounds, whilst on the east is the nála, and beyond it the line of railway. There are two main streets running north and south, named Main and Centre street, whilst the principal direction of the roads is from west and east, among which may be mentioned a fine open street—called after General Montgomery—in the centre of the bázár, the grain market, and Anderson road. The high road to Indore leaves the bázár in a north-easterly direction, and that to Simrole and Asirgarh joins it from the east.

The population of the Sadar Bázár at the time of the census of 1872 was unusually augmented by the numerous labourers employed in the construction of the railway, and the figures given by it afford, I am informed, no true indication of the present population, which is stated to be only 15,896. Unfortunately the results of the census of 1881 are not as yet available for comparison.

The population, according to the census of 1872, amounted to 17,640 persons, of whom 9,634 were males and 8,006 females, being in the proportion of only 83 females to every 100 males. Perhaps this great disproportion is due to the number of labourers present. It consisted of—

Castes.	Males.	Females.	Total.	Ratio of Males to Females.	Ratio to Total Population
Christians	166	117	283	70·5	1·6·2
Hindus of caste	4,149	3,079	7,228	74·2	40·7
Do. low caste	2,066	1,960	4,026	94·9	22·5
Jains	3	1	4	33·3	0·2
Musalmáns	2,913	2,540	5,453	87·3	30·9·1
Pársis	142	155	297	109·1	1·6·8
All others	195	154	349	79·0	1·9·8
Total ...	9,634	8,006	17,640	83·1	...

Taking the Cantonment Magistrate's figures as representing the present population it is found that 2,072 persons were living in 532 houses of the better class, whilst 1,807 houses of an inferior sort contained 6,253 inhabitants, and there are also 3,270 huts with a population of 7,571 persons. There were, therefore, on an average 3·9 persons living in each of the better sort of houses and 3·4 residents in each house of inferior description, whilst each hut contained on the average 2·3 inhabitants. The houses were, therefore, if the population statistics are correct, not overcrowded. The houses facing the main lines of thoroughfare preserve regularity as regards their frontages, but with respect to elevation and the line in rear no attempt at uniformity has been kept; and in the poorer mohullás huts are built in a most irregular manner, and the passages through them are tortuous.

The great majority of the houses have tiled roofs, but there are 634 thatched huts.

The length of metalled roads in the bázár is about 7 miles, and of unmade or moorum about 5 miles.

There are stated to be 714 private privies inside the houses; these, as a rule, have no receptacles below them, and the nightsoil and urine fall down on to a chunamed platform below the seat. The privies are cleaned from a lane at the back of the house, and the liquid refuse is received into a cesspool; but as there

are said to be only 430 cesspools in the bázár it is evident that much offensive liquid must soak into the soil. The cesspools are constructed of brick and lime, and some are even of brick and mud. All new ones are made of brick and lime, stone and lime, and are covered, but not so closely as to prevent ventilation. There are 32 public latrines—16 for males with 104 seats, and 16 for females with 135 seats.

Much good work has lately been done by making open road-side drains of stone set in lime; but the work is not completed, and the drains end anywhere, so that any liquid matter in them eventually flows out on to the ground to be absorbed. They are at present intended to carry storm water. All the drainage of the Sadar Bázár is carried off by the main nálá to the river Satia.

There are no dust-bins, but about 50 places are appointed for depositing dry refuse until it is carted away.

The scavenging establishment for the Sadar Bázár is as follows :—

Inspector of Nuisances.	Head Mukádam.	Second Mukádam.	Beldárs.	Sweepers.			Dry Refuse Carts.	Dry Refuse Carts, additional during the Monsoon.
				Male.	Female.	Boys.		
1	1	4	8	29	12	2	6	3

The dry refuse is taken to a field on the east side of the railway on the Simrole road, where it is deposited on the ground and sold to a contractor. This place is about 150 yards distant from the bázár beef slaughter-yard, and only 400 yards from the east end of the bázár, and not quite three-quarters of a mile from the centre of the market. The carts do not belong to the Cantonment Committee, but to a contractor. All the nightsoil from private privies in the bázár is removed by private agency.

The nightsoil establishment employed by the Cantonment Committee consists of—

For cleaning Public Latrines.			For cleaning Cesspools.		
Sweepers.		Carts.	Iron Tank Carts.	Buffaloe Puckals.	Extra Sweepers during Monsoon.
Male.	Female.				
13	8	4	16	4	16

The nightsoil until very lately was buried in trenches, which are a little to north-east of the dry refuse yard, but recently the poudrette system has most advantageously been introduced. The field where the nightsoil and cesspool water are taken, covers an area of upwards of 6 acres.

It is within 300 yards of the Satia River and about 100 yards from the dry refuse yard. The private sweepers bring their collections to this place. The cesspool water is still emptied into trenches, and the land is water-logged, and it emits a most offensive smell. The establishment works under the supervision of a conservancy serjeant. The principal roads are, as a rule, well swept, but there is a good deal of litter lying about; as, although the 6 refuse carts each make 6 trips a day, yet it is impossible for them to collect all the refuse in the town.

The beef and mutton, fish and offal sellers' markets are situated in the centre of the bázár, and contain 68 stalls, which are let out by contract for Rs. 200 per mensem.

There is also a vegetable and fruit market established along one side of Montgomery road, but in the open space opposite the beef and mutton markets are several mat sheds in which the vegetable sellers sit. Altogether in the fruit and vegetable market are 58 stalls which are let out by contract for Rs. 117 per mensem.

The bázár beef slaughter-house is situated on the east side of the railway and between it and the cutchra manure yard. It is enclosed by a wall, and the space inside is entirely paved with cut stone; over one-half is built a shed with corrugated iron roof which is entirely open on the east side, the west wall being perforated with bottle openings. The carcases are hung on hooks on the beef trees under the shed. The blood, &c., is received into a cesspool, which is cleaned daily.

The slaughter-yard for sheep is simply a shed with a corrugated iron roof, but open on all sides, erected on the banks of the main nála near the Gokul Gunj bridge. Its surface is paved.

The daily number of animals slaughtered are 25 sheep and goats, and 12 head of cattle.

The following number of animals is said to be kept in the Sadar Bázár :—

Horses.	Ponies.	Buffaloes.		Cows.	Bullocks.	Sheep and Goats.	Others.	Total.
		Milch.	Bull.					
42	93	369	100	1,117	3,443	3,192	246	8,602

These animals have no proper stables. They are tethered inside and outside the houses, and all their stale soaks into the soil.

The drinking water of the Sadar Bázár is solely derived from wells in it or on its outskirts.

There are stated to be 115 wells, all of which are open: 78 are private property, the rest are public, and are paved around the basement of the parapet wall. Fifty-eight of the wells are stated to be brackish; and although the remaining 57 are said to yield potable water, the analyses of many of those most frequented show how dangerous they are. Two of them are so bad that they have been condemned by the Cantonment Committee, but their tops are not bricked over: but notices painted on boards have been placed near them to warn the people not to drink the water. This I fear, as the majority of the residents are unable to read, is not of much avail.

The Dorábji Pestonji Charitable Dispensary is situated at the head of the bázár near the Kotwáli. This excellent institution, which is a very great boon to the inhabitants, was endowed by Mr. Dorábji Pestonji and is supported also by a yearly grant from the Cantonment Committee and by public subscriptions. It virtually takes the place of a small Civil Hospital, as it has accommodation for 8 male and 4 female in-patients. During 1882, 79 in-patients and 7,557 out-patients were treated in it, the average daily attendance for in-patients being 8·4 and for externs 79·9. Malarial fevers formed the largest number of cases, and amounted to 2,958. A case of enteric fever in the person of the hospital assistant was treated in it during the year. The man recovered, but I am indebted to the Staff Surgeon for the diary of the case. Two hundred and eighty-six cases of diarrhœa, 193 of dysentery and 74 of scurvy were also treated.

The total income of this institution in 1882 amounted to Rs. 25,895 and the expenditure to Rs. 1,867.

The cemetery for Christians is situated about 600 yards east of the Commissariat lines, whilst the Mahomedan burial-ground is on the north of the Cantonment, about a mile from the Sadar Bázár near the road to Indore and the village of Kisunpura.

The Hindu burning ghát is on the east near Gujia Khera. The Jews' burial-ground is situated outside Cantonment limits on the north-west over the Gumbir River.

The Pársi tower of silence is on a hill about 3 miles south of the Cantonment. All these burial-grounds are in good order.

The statistics of vaccination since 1876 performed by the station vaccinator will be learnt by the following table:—

Years.	Number of Children vaccinated.		Number of Children re-vaccinated.		Successful.		Unsuccessful.	
	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.	Boys.	Girls.
1876	411	458	8	16	382	410	47	64
1877	579	533	3	4	469	437	108	105
1878	391	366	4	7	275	255	117	121
1879	397	374	12	8	339	315	70	67
1880	377	366	78	37	416	350	39	53
1881	390	378	75	50	385	365	80	63
Total ...	2,545	2,475	180	122	2,266	2,132	461	473

All births and deaths in the Sadar Bázár are registered at the Kotwáli, and reported to the Cantonment Magistrate. Heads of families failing to report are liable to punishment under Cantonment regulations; all other births and deaths in the station are reported by heads of departments. The following return shows the number of births registered by caste, sex, and ratio per 1,000 of population in each of the ten years:—

Years.	Native Christians.		Musalmans.		Hindus.		Pársis.		Others.		Total.			Ratio per 1,000 on total Population.
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Total	
1872	...	1	60	59	88	66	9	5	47	37	204	167	371	22·3
1873	2	1	83	55	99	127	10	3	78	67	270	253	523	30·9
1874	...	...	95	82	129	119	10	4	81	63	315	268	583	33·2
1875	1	...	70	69	130	116	8	6	84	67	293	258	551	30·4
1876	...	...	62	68	139	136	9	11	82	68	292	277	569	30·1
1877	3	1	68	77	121	109	9	11	51	70	252	274	526	26·8
1878	4	...	80	70	93	95	1	12	93	66	270	245	515	26·4
1879	1	2	70	74	98	97	2	5	50	55	221	233	454	22·9
1880	3	1	73	69	100	77	3	5	66	62	245	213	458	23·7
1881	1	3	76	81	111	111	6	12	105	93	301	300	601	27·8
Total ...	15	9	737	700	1,067	1,044	75	73	734	665	2,671	2,491	5,162	

From the above table it appears that the births are fairly registered. The number and causes of deaths registered in each of the 10 years ending 31st December 1881 in the Sadar Bázár and in the Cantonment outside regimental lines will be learnt from the following table:—

Years.	Cholera.		Small-pox.		Fever.		Bowel Complaints.		All other Causes.		Total.			Ratio per 1,000 on total Population.
	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Total.	
1872	...	...	4	2	140	113	28	22	198	125	374	262	636	39·1
1873	...	...	5	10	157	102	23	17	167	156	352	285	637	39·6
1874	...	...	...	...	120	93	20	14	161	136	301	236	537	27·8
1875	5	3	1	...	134	109	15	15	187	160	338	305	643	30·4
1876	...	...	...	...	104	99	12	12	155	134	304	256	560	27·8
1877	1	...	3	6	168	98	12	8	160	124	376	236	612	32·3
1878	15	6	2	1	240	215	19	9	201	180	536	320	1,106	49·6
1879	...	...	...	...	129	106	13	11	117	114	259	231	484	23·6
1880	...	...	2	2	116	81	10	6	113	113	272	209	471	22·9
1881	...	...	1	1	126	96	11	7	134	110	298	223	511	23·8
Total ...	24	9	19	22	1,433	1,104	173	131	1,679	1,352	3,307	2,713	6,049	

Table 2 shows deaths by caste :—

Castes.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	Total.
Native Christians	5	3	5	6	13	6	9	5	4	6	62
Musalmáns	182	202	154	171	140	122	225	165	150	149	1,760
Hindus	295	294	252	306	266	258	426	191	190	226	2,704
Pársis	7	6	12	6	6	3	25	9	5	9	88
Others	146	109	114	154	105	125	321	114	128	121	1,435
Total ...	635	614	537	643	530	514	1,106	484	475	511	6,049

And Table 3 the deaths by ages :—

Years.	Under 1 year.	Under 1 year and over 6.	Under 6 years and over 12.	Under 12 years and over 20.	Under 20 years and over 30.	Under 30 years and over 40.	Under 40 years and over 50.	Under 50 years and over 60.	Over 60 years.	Total.
1872	210	93	33	34	76	42	41	37	69	635
1873	196	88	19	33	63	47	39	45	84	614
1874	167	74	21	35	74	27	23	41	75	537
1878	325	257	85	83	89	63	36	43	125	1,106
1879	118	62	24	29	54	41	26	40	90	484
1880	122	65	16	24	56	42	45	46	59	475
1881	145	55	19	28	58	52	40	50	64	511
Total ...	1,283	694	217	266	470	314	250	302	566	4,362

During the 3 years, as under, the register was kept in this form :—

Years.	Under 1 year.	Under 16 and above 1.	Under 55 years and over 15.	Over 55 years.	Total.
1875...	216	128	186	113	643
1876...	176	90	155	109	530
1877...	195	51	147	121	514
Total ...	587	269	488	343	1,687

From the above tables it will be seen that the death-rate in the Sadar Bázár is always very high, and must be a source of great anxiety to the Military authorities.

In 1875 it attained the very high rate of 40·4 per 1,000, but in 1878 the enormoously high rate of 69·6 per 1,000. There was an outbreak of cholera during that year, but only 21 out of the 1,106 deaths that were recorded were ascribed to that cause. The great increase of mortality being due to fever, 696, or 60 per cent. of the total deaths, took place in young persons under the age of 12; and in fact, as shown by Table 3, in the years named, 50 per cent. of the total deaths occurred among young persons under 12.

As a high rate of mortality among children is the surest test of insanitary conditions, it shows that the Sadar Bázár is in a most unsatisfactory condition.

The most urgent want is a supply of good water, and this can only be provided by a general scheme for the whole of the Cantonment; but I trust the authorities will give consideration to the fact that the very position of the bázár in the centre of the Cantonment is a source of great danger to the troops, and that any epidemic among its inhabitants is more than likely to spread to the troops.

Without a water-supply no system of drainage can be efficient, and yet this is most urgently required, for the ground throughout the bázár is saturated with polluted matters, and it must needs be so. How is it possible for 16 carts, although they make 6 trips a day, to remove the liquid refuse of a population of upwards of 15,000 persons? The bázár is most favourably situated for drainage, and if only there was sufficient water to flush the drains, a sewerage scheme might be constructed to deliver the nightsoil and liquid refuse of the bázár most safely on to the fields on the east. In the meantime, taking things as they are, I think the conservancy arrangements are capable of great improvement. In the first place, no town in India can be considered in a satisfactory state where the nightsoil is removed by private agency. The work, as I have had evidence, is often simply not done, and nightsoil remains within the inhabited area for days. This is not the fault of the conservancy serjeant, who does what he can to remedy matters by summoning the tenant before the Cantonment Magistrate, but the system is and must be a failure. I, therefore, strongly recommend that, from a date to be fixed, the Cantonment Committee undertake the work of removing *all* the nightsoil from the bázár—that from the private houses as well as that from the public latrines. Of course if this is done it will be necessary to impose a halálkhor cess to cover expenditure. The Cantonment Magistrate has lately directed that iron pans be placed below each privy. This is much needed; but it must be remembered that as the pans will or should hold the ablution water and urine as well as the solid nightsoil, the labour of conveyance to the manure-yard will be much greater; but it should be rigidly insisted upon, as at present very much of this matter soaks into the soil and pollutes the wells.

Then I think the public latrines are almost all of a most faulty construction, and some are so offensive that I wonder the people *can* go inside them. I suggested to the Cantonment Magistrate in September that public latrines should be built according to Colonel Goodfellow's pattern, and he has erected one near the Native Infantry lines which I think will prove a great success. It must be remembered as a cardinal point that not a particle of lime should ever be used in a privy, and at all events during the fine weather there should be no roof, and that the sides should consist of bamboo battens fastened to wooden uprights. This has been done in the new privy, except that by mistake a little lime has been used.

I recommend the Cantonment Committee to pull down the existing public privies, and substitute others on the above plan, and to insist on all new private privies being built on this pattern. The Poona system of poudrette has been carried out, but I do not think this is as good as the Násik plan.

The contract for removal of cutchra from the yard has not expired; but when it does, I strongly advise the Cantonment to burn each day's collection of cutchra, which should be taken to the place where the poudrette is made, where it should be carefully sieved and stored.

Sheds after the Násik plan should be run up, so that the work may be continued during the monsoon.

The present disposal of the cesspool water is open to the greatest sanitary objection, and should be forthwith stopped.

I recommended Captain Ashfield, Acting Cantonment Magistrate, to utilize it by irrigating growing crops after the native fashion. There is plenty of ground, and it might be at once utilized in this manner, which I am sure would be a great improvement. During the monsoon this liquid refuse should, in my opinion, be thrown into the river below Kisunpura. There are no villages below stream for many miles. The number of carts for removal of dry rubbish requires to be largely increased, and at least doubled. It is impossible for the amount of cutchra to be removed by 6 carts.

As regards the existing water-supply, I advise that all the wells which are brackish be permanently closed by a masonry dome, and that at those which yield sweet water the measures already recommended regarding wells be taken.

It is thought that most of the wells inside the bázár should be closed, and that new ones be sunk outside for the use of the inhabitants. If this course is

taken, the recommendations of the Army Sanitary Commission should be most scrupulously carried out.

I also strongly recommend that measures be taken to remove the large number of animals at present in the heart of the bázár, and that they be located in proper stables outside.

The stables belonging to Mr. Ardasir are, in my opinion, a source of nuisance and danger, and I think they should be removed and the ground be bought by the Cantonment Committee.

The neighbourhood of the prostitutes' houses in the Chuckla is very filthy, and exposes the soldiers who frequent these places to disease. If they could be removed further away it would be a great advantage.

I also advise that no person be allowed to build a new house or rebuild an old one without having provided a privy detached from the house, and constructed according to a standard plan.

In conclusion I must express my acknowledgments to General Sir Robert Phayre, K.C.B., and to all the Officers who have so kindly aided me in my enquiry. I am greatly indebted to the Officers commanding corps and to Deputy Surgeon General Campbell Fraser, Surgeon Major Taylor and all the Medical Officers; as well as to Major Watling, Assistant Quarter Master General; Major Gibbs, the Executive Engineer; Colonel Griffiths and Captain Ashfield, the Cantonment Magistrates.

T. G. HEWLETT,
Deputy Surgeon General.

No. $\frac{167}{C}$ of 1883-84.

Cantonment Committee Office,
Mhow, 21st June 1883.

From

THE SECRETARY, CANTONMENT COMMITTEE,

MHOW;

To

THE SANITARY COMMISSIONER FOR THE GOVERNMENT OF BOMBAY,

BOMBAY.

SIR,

With reference to your letter No. 1450 B, dated 16th May 1883, I have the honour, by direction of the President, Cantonment Committee, to forward the accompanying copy of the remarks of the Committee, with accompaniments as per margin, on your inspection report of the Cantonment of Mhow.

A. Executive Engineer's rough estimate.
B. Report from Brigade Surgeon Bradshaw.
B/1. Return of admissions into hospital and deaths among the British corps.
C. Letter, dated 5th June 1883, from Surgeon Major Taylor.
D. Letter No. C—4, dated 8th June 1883, from the Assistant Commissary General.
E. Letter No. $\frac{1383}{M}$, dated 1st June 1883, from the Cantonment Magistrate.
Rough estimate of the cost of removing the present public latrines and substituting new ones,—for Rs. 5,477.
Rough estimate of cost of removing, by public service, all nightsoil from the bázár,—for Rs. 2,500.

I have the honour to be,
Sir,
Your most obedient Servant,
W. ASHFIELD, Captain,
Secretary, Cantonment Committee.

Remarks by the Lieutenant-General Commanding the Mhow Division and the Mhow Cantonment Committee upon the Report on the Cantonment of Mhow forwarded with Sanitary Commissioner's letter No. 1450 *B, dated* 16*th May* 1883.

Sanitary Commissioner's Report.	Replies.
No. 1, page 2 of the Report: Remarks on boundary line of cantonment.	Hitherto the Indore Darbár has resisted all attempts to alter the boundary line so as to include, within camp limits, any of the villages named. Nothing would induce them to do it.
No. 2, page 5, para. 2: Remark regarding night urinal tubs.	The attention of the Officer Commanding 2nd Battalion, Lancashire Fusiliers, has been called to this, with a view to immediate remedy.
No. 3, page 5, para. 6: Staff Serjeant's quarters.	Attention of Executive Engineer called to this, with a view to remedy. The separation of latrines from the cook-rooms and ablution rooms of the three arms will cost about Rs. 1,500: *vide* Executive Engineer's Report, marked A, attached. The question of refuse water is dealt with in the same report. It would seem that the old system of cesspools and halálkhors will have to be reverted to at a very great expense. Not many years ago, these were done away with for the present system. Excepting near the Cavalry barracks there is no soil good for gardens.
No. 4, page 6, para. 1: About leakage around Macnamara filters and the roofs of barracks.	As recommended by the Sanitary Commissioner at page 37, para. 5 of his report, the Executive Engineer has been directed to look to the roof leakage: estimate to remedy drift rains in barracks, amounting to Rs. 1,500, in annexment A. Recommendation, also, of Executive Engineer regarding Macnamara filters will be adopted, if approved.

No. 5, page 6, para. 3: Drains in a dirty state.	Attention of Commanding Officer has been called to this, and remedy applied.
No. 6, page 6, para. 4: Old tank.	This has been attended to.
No. 7, page 7: Field Battery barracks.	Latrine ventilation will cost Rs. 1,500, as per estimate in annexment A.
No. 8, page 8: Artillery followers' huts.	New huts are in course of being provided. One block has been built; another will be proceeded with when weather admits.
No. 9, page 8: Artillery drinking water.	Well No. 35 A is now dry, and the Battery drinking water is taken from well No. 31 A at present. The subject will receive careful attention. No water is allowed to be brought from No. 24.
No. 10, page 9: Heavy Battery, para. 1.	Ventilation ordered when Rs. 3,000 can be obtained: *vide* annexment A.
No. 11, page 9, para. 5: Recommendation to condemn the barracks occupied by Heavy Battery.	The accompanying return, marked B/1, of the actual admissions in hospital per 1,000 of average strength and the number of deaths in and out of hospital of each regiment at Mhow, between 1st April 1881 and 1st April 1883, is attached, and it will be seen from it that the average daily sick of this Battery is less than half that of the other corps, and altogether less than any other. Under these circumstances the Lieutenant-General Commanding cannot concur in Deputy Surgeon General Hewlett's proposal to abandon these barracks.
No. 12, page 10, para. 5: Cavalry barracks.	Measures adopted to remedy the defects pointed out with regard to the urine tub and filter.
No. 13, page 10, para. 7: Alteration of latrine in rear of each Cavalry barrack.	The Executive Engineer estimates the cost of improving the present urinals at Rs. 1,500.
No. 14, page 12, para. 2: Bath-room water of Serjeant's quarters, &c.	The Executive Engineer's report A., para. II, refers to this.
No. 15, page 12, para. 3: Filter and want of protection from rain.	The Executive Engineer's report A specifies Rs. 5,000 as required for this work, which will also answer the purpose of preventing the men from sleeping on the balustrade and falling over. The ventilation required will be given.
No. 16, page 12, para. 4: Ventilation of cook-room.	
No. 17, page 13, para. 4: Dampness of ground floors of Cavalry barracks.	The subject is resumed at pages 35 to 37 of Dr. Hewlett's report, which will be reported on.
No. 18, page 14, last para: Bath-room water in Station Hospital left to stagnate.	The Brigade Surgeon has reported on this subject: *vide* letter attached.
No. 19, page 15, para. 8: Wash-house water of hospital.	Same as above.
No. 20, page 7: Garrison cells.	A new set of garrison cells is under erection near the Infantry barracks; when complete, the fort cells will be abandoned.
No. 21, page 19: Lock Hospital.	For many years past unsuccessful efforts have been made to move the Indore Darbár to grant what the Sanitary Commissioner here recommends. Of course, if Government wish the correspondence with the Agent, Governor-General, re-opened, it will be so; but the Lieutenant-General commanding feels sure that it is hopeless to attempt to move the Mahárája Holkar to make any concession in the matter. It should be remembered, too, that the extension of the Act in the manner suggested, would require a large augmentation of the police, in order to carry out the increased supervision.
No. 22, page 19: Water-supply.	There can be no doubt that the want of a copious supply of pure, wholesome water in the Mhow Cantonment and bázár is one of the chief, if not the *chief* cause of sickness amongst the troops, as well as the inhabitants of the Sadar Bázár. At page 25 of his report the Sanitary Commissioner remarks that, for many years past, the attention of the Military authorities has been

Sanitary Commissioner's Report.	Replies.
	directed to this point, but that last year the amount that had been collected from ábkári funds was spent upon roads in Central India, not directly connected with the Mhow Cantonment.
	This, it is feared, has thrown back the desired improvement for several years. Again, in the last para. of page 45, the Sanitary Commissioner observes: "The most urgent want is a supply of good water" &c., for the whole cantonment. Having thus invited attention to the only real remedy for the evil complained of by the Sanitary Commissioner, the Cantonment Committee, with reference to Dr. Hewlett's proposal at page 24 of this report to procure a water-supply from wells in the valley to the south of the general parade-ground, submit the Executive Engineer's estimate, and the cost of that project, which will amount to Rs. 1,53,000; but it is doubtful whether anything like a sufficient supply of water would be thus obtained. Moreover, this spot is supposed to be the main source of Mhow Cantonment malaria by Dr. Hewlett.
Vide page 36, paras. 4 to 6 of the report.	
	This estimate does not include the recommendations for each well throughout the bázár and cantonment, as contained in the report under reply, the estimate for which it would take some time to prepare.
No. 23, page 19, para. 5: Wastage water from baths, &c.	Para. 2, report A from the Executive Engineer, already referred to above, enters into this question. It is a matter of fact that the filtration of such wastage water is not likely to affect any adjacent well in its neighbourhood.
No. 24, page 23, para. 3: Well No. 35, or the Station Hospital well.	Ground has been cleaned around this well.
No. 25, page 23, paras. 5 and 6: Dirty nála.	Has been cleaned and the surface ground generally near wells.
No. 26, page 23, para. 7: Analysis said to be good, but notwithstanding that, water pronounced unsafe by Sanitary Commissioner.	It would seem that, if a duly scientific analysis is not accepted, we have no fixed standard to go by, except experience resulting from the use of each well.
No. 27, page 23, last para.: Library well No. 22.	This is reputed to be the best well in camp, and is more used than any other. In the opinion of the Cantonment Committee it is excellent water, and bears no sign of having suffered from the causes named. The secretary of the library, however, has been furnished with a copy of the Sanitary Commissioner's remarks regarding the privy and out-houses.
	The Committee, having fully considered this matter, intend to remove the latrine (which is only used by 2 or 3 persons) to the east end of the block of servants' houses; the removal of the latter is considered unnecessary, as, in the opinion of the Cantonment Committee, they cannot possibly affect the purity of the well.
	With regard to the proposal that the Cavalry should use this well, it is believed that the effect of such a strain on it would be to exhaust its supply by May at furthest.
No. 28, page 24' paras. 3, 4 and 5: Wells in Native Infantry and Cavalry Lines.	No other water than is procurable from these wells is available in these lines and at the northern extremity of Cantonment, and never will be, until the general water scheme is carried out.
	The remark about the brick tube being cased with concrete has been brought to the notice of the Executive Engineer, with a view to remedy whenever money can be obtained. The work is estimated at Rs. 11,000 for wells used by troops alone; the bázár wells, if included, would cost Rs. 28,000 more.
No. 29, page 24, paras. 7, 8 and 9, regarding probability of good water being obtained at the southern extremity of cantonment.	Reported on in para. No. 22, above.

Sanitary Commissioner's Report.	Replies.
No. 30, last para. of page 24, and para. 4, page 25, about disuse of leather mussocks and the substitution of galvanized zinc vessels for the troops.	The Lieutenant-General Commanding would deprecate any interference with the Indian system of carrying water in mussocks, which meets the requirements of field service in a way that zinc vessels could not properly do. This proposal opens out such a wide field for consideration before it could be properly carried out, that if the idea be entertained, a separate report, entering fully into all details of the re-organization of the present system, would have to be prepared.
No. 31 : Zinc tubs for cook-rooms in cantonments.	This might easily be adopted, and with great advantage. Orders of Government required.
No. 32, page 25, paras. 6 and 7. Water in bázár, sodawater, &c.	This point, about the purity of the bázár water-supply, &c., was thoroughly gone into by the Medical Committee of 1880, and the strictest supervision is exercised in accordance with their recommendations : the bázár filters are carefully inspected by the Cantonment Magistrate's establishment.
No. 33, page 25, para. 9 : Details the scheme for supplying Mhow with water.	Referred to in reply No. 22, above. As this is the only true remedy for the impure and deficient water-supply of Mhow Cantonment as a whole, the Cantonment Committee would respectfully recommend that the cost of the new water-works be admitted as an Imperial Military charge.
No. 34, page 26 : Steam bakery.	Report by Assistant Commissary General, marked D, attached. This matter was brought to the notice of Government by the Assistant Commissary General in 1879, and again by the Commissary General in 1881. It is of the utmost importance in a large European station like Mhow.
No. 35, page 37 : Additional vegetable ration for troops.	This is a most valuable proposal.
No. 36, page 27, para 3 : Milk.	Report E, from Cantonment Magistrate, annexed.
No. 37, page 34, para. 5 : Enteric fever.	The Sanitary Commissioner's opinion, that impure water is one of the principal causes, furnishes an additional reason for the water scheme detailed, pages 25-26.
No. 38, page 34, para. 6 : Proposal that Cavalry wells 14 and 15 be abandoned and that the Cavalry use Library well No. 22.	Answered in reply No. 27, above.
No. 39, page 35 : Malaria and dampness in sub-soil as existing causes of enteric fever.	This subject is fully dealt with by the Sanitary Commissioner in pages 36 and 37. The attention of the Executive Engineer has been drawn to the recommendations for sub-soil drainage which will cost in the Cavalry and Infantry Rs. 70,000. This dampness of sub-soil appears to the Cantonment Committee to be the main cause of enteric fever at Mhow.
No. 40, page 38 : Native Infantry Lines.	The whole question of the construction of new lines is before Government, and until the decision is known, no expense should be incurred in altering existing arrangements. The latrines are certainly some distance from the lines, but it is difficult to see how they can be brought nearer without encroaching on the already very confined parade-ground. The remarks of the Sanitary Commissioner on minor matters have been brought to the notice of the Officer Commanding the Regiment.
No. 41, page 38 : Ordnance Lines.	The ordnance lines are doubtless, as described by the Sanitary Commissioner, "wretched places"; but it must be remembered that the men have to keep up their houses themselves, without regular assistance from Government. The site of the latrine is bad, but the situation of the line is such that it would be difficult to put it on any other spot with due regard to decency and preservation of the water-supply.
No. 42, page 39 : Conservancy of Regimental Lines.	The conservancy of the privies and compounds of officers' houses has not hitherto formed the subject of any adverse report, but attention will be paid to it. The disposal of the liquid filth

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from the cook-rooms is a matter of great difficulty; it will also form the subject of consultation by the Cantonment Committee. As noted by the Sanitary Commissioner, the absolute absence of water in Mhow prevents any attempt being made to water the roads in camp.

Since the visit of the Sanitary Commissioner to the nightsoil pits, burnt ashes, instead of dry earth, have been regularly used for mixing the poudrette, and the smell reduced to a minimum.

It must be remembered that the poudrette system is only on trial at Mhow, and it appears somewhat doubtful whether it can be carried on successfully. Under these circumstances it seems advisable that the present system of working it should not be interfered with just now.

Looking at the situation of the various barracks at Mhow, it would seem that 2 filth yards will always have to be maintained. The Sanitary Commissioner objects to the present central position of the yards; and, if they have to be changed, ground available for this purpose would have to be selected at both ends of camp, as there is no other ground available in a central position. This would, of course, entail increase of expenditure and establishments, &c.

The grass being allowed to grow in the officers' compounds during the rains, will form the subject of a station order. Similarly, the rank vegetation of the Government garden will be attended to. Drainage is simply a matter of expense, for which but little money is available. A bank and ditch were allowed to be substituted for a hedge, because the want of soil and water in the cantonment rendered it a matter of impossibility to keep up decent hedges, and wire fences are dangerous and unsightly. There is no authority by which landlords could be forced to build walls round the compounds. Such walls would, in most instances, cost more than a year's rent of the bangalows.

The village of Pensionpura was established long before matters of hygiene received the attention that they do now.

It has for many years been decided that the village should be gradually done away with, and no new buildings have been for a long time sanctioned, and nothing but temporary repairs to existing houses have been allowed.

To resume the village at once would cost a very large sum for compensation, and there is little probability of the money being provided by the Cantonment Fund.

The matter of the piggery will again form a subject of consideration. It has hitherto been allowed to exist under careful supervision, and without any objection on the part of the medical officers.

No. 43, page 41: Sadar Bázár.

The whole of the bázár has been marked out in regular lines with due regard to ventilation. The old houses are being removed as fast as possible, and are re-erected in the new lines.

Similarly, a regular and complete system of drainage was inaugurated in 1875-76, and has been partially carried out.

Want of funds has prevented the completion of this work in common with other desirable sanitary improvements.

With regard to the Sanitary Commissioner's remarks regarding the disposal of the cesspool water, a better arrangement will be attempted after the conclusion of the ensuing monsoon.

With regard to the number of animals kept in the bázár, there is no possibility of making other arrangements regarding them without interfering in an unnecessary degree with the daily occupations and customs of the inhabitants.

The subject of the water-supply has been so fully entered into above (*vide* answer No. 22) that further reference is needless. It is sufficient to say that the sanitary state of the bázár is doubtless attributable almost entirely to this cause, which has

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been the subject of report since 1874, and which cannot be satisfactorily ameliorated, except by the new water scheme. The contract for the sale of dry rubbish expired on the 31st March last, and since that date the rubbish has been brought and used in the preparation of poudrette.

A committee is now sitting to value the stables of Mr. Ardesser, with a view to their removal from their present position.

The removal of the Chuckla to another situation will form the subject of consideration; but there would appear to be insuperable obstacles, on the score of compensation alone, to such a proceeding.

Referring to page 47, para. 4 of the report, there is at present no known law by which a person can be compelled to build a privy, but it can be arranged that no privy shall be sanctioned *inside* a house.

In conclusion it may be stated that the Cantonment Committee are thoroughly and practically aware of all the deficiencies in the conservancy, water-supply and sanitary condition of the bázár generally; but they desire to point out that such defects can be all ascribed to one cause, *viz.*, want of funds.

A new system of taxation will probably be shortly introduced into this cantonment, and it is hoped that this will place increased funds at the disposal of the Committee, and enable them to carry out those improvements and complete those works which have long been recognized as desirable on sanitary grounds.

The following estimates are attached :—

1*st*.—The cost of removing the present public latrines, and substituting new ones, according to the plan recommended, —Rs. 5,477.

2*nd*.—Cost of removing, by public service, all nightsoil from the bázár,—Rs. 2,500.

(Signed) R. PHAYRE, Lieutenant-General, Commanding Mhow Division, and President Cantonment Committee.

(Signed) W. CAREY, Colonel, Commanding Royal Artillery, Mhow Division.

(Signed) R. W. MEADOWS, Deputy Surgeon General, M.C.

(Signed) J. S. O'NEILL, Lieutenant-Colonel, Commanding 2nd Lancashire Fusiliers.

(Signed) W. S. PEAT, Major, Cantonment Magistrate.

(Signed) G. R. GIBBS, Major, Executive Engineer, M.D.

(Signed) J. WATLING, Major, Assistant Quarter Master General, M.D.

(Signed) W. ASHFIELD, Captain, Assistant Cantonment Magistrate, and Secretary Cantonment Committee.

(Signed) EDULJEE PESTONJEE, Khán Bahádur, Honorary Magistrate.

(True Copy.)

W. ASHFIELD, Captain,
Secretary, Cantonment Committee.

A.

Rough Estimate prepared by Major G. R. Gibbs, Executive Engineer, of the probable cost of carrying out some of the recommendations made by Deputy Surgeon General Hewlett in his Sanitary Report on Mhow.

References.

Deputy Surgeon General Hewlett's Report on Mhow.
Lieutenant-General Sir R. Phayre's orders on the above.

Report.

The points to which the Executive Engineer's attention has been more particularly drawn may be summed up as follows:—

I.—Sub-soil drainage—

(*a*) Of the ground south-west of the European Infantry barracks.

(*b*) Of the ground to east of Nos. 3, 4 and 5 Cavalry barracks and of Nos. 4 and 5 European Infantry barracks, and south or west of Nos. 1 and 2 Heavy Field Battery barracks.

II.—Digging up the floors of the barracks and replacing them in a thick layer of concrete.

III.—Surface drainage—

(*c*) Disposal of waste water from bath-rooms and kitchens.

(*d*) Clearing ground about wells.

(*e*) Concrete casing round the masonry steining of wells to a depth of 20 feet (in width).

IV.—Leakage and protection from drift rain—

(*f*) Roofs of Nos. 4 and 5 European Infantry barracks and others.

(*g*) Protection of verandahs of barracks from drift rain.

V.—Ventilation—

(*h*) Of the barrel-vaulted barracks of the Heavy Field Battery.

(*i*) Of the barrel-vaulted kitchens and latrines of the Heavy Field Battery.

(*j*) Of the urinaries of the Cavalry (and other) barracks.

VI.—The objections to kitchens, latrines and ablution rooms being built as portions of one block of buildings.

VII.—The necessity for impervious platforms in the verandahs of barracks for—

(*k*) Urinals for use at night.

(*l*) For Macnamara filter stands.

VIII.—The substitution of zinc for wooden tubs for water used in the kitchens.

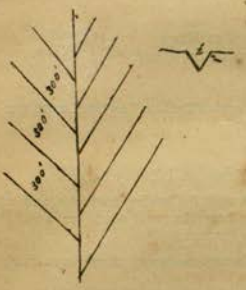
IX.—The objections to the present arrangements for the disposal of the bath-room waters from the serjeants' quarters in the upper and lower storeys of the Cavalry barracks Nos. 3, 4 and 5.

X.—The necessity for carrying out the water-supply scheme by constructing a reservoir at Baircha, &c.

XI.—The submission of the rough estimate formerly made out for a supply of water from the low ground south-west of the European Infantry barracks and for pumping it up to the European Infantry barracks.

Without considering the question as to whether the advisability of carrying out these proposals should be discussed or not, the approximate cost is mentioned below for several of them.

I.—Sub-soil drainage—



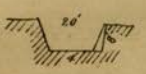
(*a*) Of the ground to the south-west of the European Infantry barracks. Drainage cuts to drain nearly a square mile of ground, the diagonal cuts being about 100 yards apart, and the bed of the existing nála being rectified.

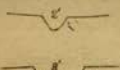
Diagonal cuts.

Mean length.	Cb. ft.
$2 \times 17 \times 2{,}000 \times 10$ mean area	680,000

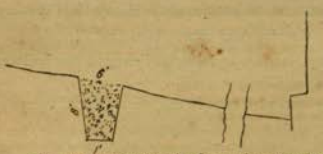
Main cut.

$1 \times 5{,}000 \times 96 \left(\frac{\text{Mean area.}}{1{,}500} \text{ about}\right)$	480,000
Total cubic feet ...	1,160,000
1,160,000 cubic feet moorum and black-soil excavation @ 12 per 100 cubic feet	Rs. 8,700
Contingencies	„ 435
Grand Total ...	Rs. 9,135





N.B.—To get data for an accurate estimate, contour levels and sections would have to be taken, and it might then be found necessary to lengthen or deepen the main cut below the bridge on the Mahesur road.



(*b*) Sub-soil drainage of the ground near Nos. 3, 4 and 5 Cavalry barracks, and Nos. 4 and 5 European Infantry barracks, and Nos. 1 and 2 Heavy Field Battery barracks as recommended by Dr. Hewlett.

Nos. 3, 4 and 5 Cavalry barracks, round ends included—

Excavation in Moorum.

	C. ft.
$3 \times 500 \times \frac{6+1}{2} \times 8$	42,000
Sand filling	42,000
	Sq. ft.
Cementing slopes $3 \times 500 \times 10$	15,000

Abstract.

	Rs.
42,000 cubic feet excavation @ 1	420
42,000 cubic feet sand @ 2-8	1,050
15,000 square feet cement rendering @ 5 ...	750
Total ...	2,220
Contingencies	111
Grand Total Rs. ...	2,331

European Infantry barracks Nos. 4 and 5—

Excavation in Moorum.

East of Nos. 4 and 5 European Infantry barracks in a continuous line flanking the ends sufficiently—

	C. ft.
$1 \times 1,150 \times \frac{6+1}{2} \times 8$	32,200

Sand filling.

As for excavation	32,200

Cementing the slope and bed on the side towards the barracks—

	Sq. ft.
$1 \times 1,150 \times 10$	11,500

Abstract.

	Rs.
32,200 cubic feet moorum excavation @ 1 per 100 cubic feet	322
32,200 cubic feet sand filling @ 2-8 per 100 cubic feet	805
11,500 square feet cement rendering @ 5 per 100 square feet	575
Total Rs.	1,702
Contingencies	85
Grand Total Rs.	1,787

Heavy Field Battery barracks—

Excavation in Moorum.

On the south side, to cut off the drainage from the Hospital compound, as they are naturally well drained on the east and west sides—

	C. ft.
$1 \times 650 \times \frac{6+1}{2} \times 8$	18,200
Sand filling do.	18,200
	Sq. ft.
Cementing north slope $1 \times 650 \times 10$	6,500

Abstract.

	Rs.
18,200 cubic feet moorum excavation @ 1 per 100 ...	182
18,200 cubic feet sand filling @ 2-8 per 100 ...	455
6,500 square feet cement rendering @ 5	335
Total Rs. ...	972
Contingencies	29
Grand Total Rs. ...	1,001

II.—Digging up the floors of the European Cavalry and European Infantry barracks, and giving at least 1 foot of concrete underneath.

European Cavalry.

Nos. 1 and 2.—Area of floors approximately—

L. B. No.	Sq. ft.
$413 \times 70 \times 2$	57,820

Nos. 3, 4 and 5—

L. B. No.	
$271 \times 46 \times 3$	37,398
Total Floor Area, Cavalry ...	95,218

European Infantry.

Nos. 1, 2 and 3—

L. B. No.	Sq. ft.
413×70×3	86,730

Nos. 4 and 5—

L. B. No.	
364×48×2	33,944
Total Floor Area, European Infantry ...	120,674

N.B.—The Royal Horse Artillery and Heavy Field Battery barracks are not included in this.

	Sq. ft.
Total Cavalry	95,218
Total European Infantry ...	120,674
Grand Total ...	215,992

Say 216,000 square feet.

Abstract.

	Rs.
216,000 square feet digging up, and relaying stone flooring @ 23-16=7 per 100	15,120
216,000 cubic feet concrete @ 17-8, including digging out earth	37,800
	52,920
Contingencies	2,646
Grand Total Rs.	55,566

III.—Surface drainage—

(*c*) Disposal of waste water from bath-rooms and kitchens.

The present methods of disposal are—

(i). By open masonry drains, running to some distance from the buildings, the water then running on to the ground.

(ii). By cesspools of masonry or iron receptacles placed at the outside of the buildings, or at a short distance from them.

The first method (i) is unsatisfactory in many ways, the greatest disadvantage being that there is not sufficient water to carry away the stuff held in suspension to the end of the drain. The water evaporates generally before it reaches the end, leaving a festering deposit of matter in the drains to putrefy in the sun. Occasionally, when the drains are flushed and cleaned, the water collects in a pool at the end of the drain: complaints are then made, and perhaps the drain is lengthened, another pool at its end being soon made, to give rise to similar complaints. The drains have thus to be lengthened periodically, and will in time have to be carried down to the nearest nála to form a deposit of filth there; and as most of these drains run easterly (those from the Cavalry buildings running westerly) this filth finally taints the water above the dams made across the bed of the Sátia River. The amount is not great, however, as evaporation is so rapid that the filth remains in the drain.

Another objection to (i) is that when the masonry drains are flushed and swept down, some of the mortar, softened or decomposed by matter in the drain, gets washed or swept away, a hollow resulting, in which filth settles. Besides this, for convenience sake, portions of these drains have to be covered for roads and pathways, and filth collects under the covered portions.

(ii). Deputy Surgeon General Hewlett in his sanitary report objects to the arrangement by which in the Cavalry barracks the bath-room water falls down "an iron pipe attached to an external wall on the east, and then into a chunamed

cesspit below, from which it is removed by carts. The water from the bath-room of the serjeant's quarters in the lower storey is also discharged into this cesspool."

Unless this means that Dr. Hewlett only objects to the fact that the water from 2 bath-rooms runs into 1 cesspool, it may be inferred that he objects to the cesspool arrangement altogether. But he passes over almost without comment (although he refers to it) the arrangement of open drains and cesspools combined, adopted in the case of bath-room water from the Cavalry staff serjeant's quarters, &c., which runs by an open drain for some distance into a cesspool, whence it is used, or supposed to be used, in the soldiers' gardens to the west of the wall.*

Kitchen or flower gardens ought to be the final destination of all bath-room water and of the refuse from kitchens, and it seems only a question whether the gardens should be quite close to the bath-rooms, or at a short distance from them. This would be decided by the locality in each case.

The construction and lengthening of drains is an endless expense, and the principle of allowing filthy water to evaporate in a shallow drain seems to be fundamentally false. The formation of kitchen and flower gardens on a plan similar to that referred to above,* seems to answer best all the requirements of the case, and provides a healthy recreation for the men. The gardens should be formed as near the quarters as possible, and of such an extent as to use up all the refuse water from bath-rooms and kitchens. If the men are unwilling to work in them, prisoners or defaulters might be made to do so.

(*d*) Clearing ground about wells.—This is a matter of ordinary conservancy, and, as a matter of fact, carried out usually.

(*e*) Concrete casing round the masonry or brick tubing of wells, to a *depth* (?) of 20 feet.

Whether this is intended as a casing round the masonry or brick tubing of the wells, or as a platform round them, it would be equally useless in the case of Mhow. Concrete is porous and absorbent, less so perhaps than brickwork, more so than stone masonry. In either case it would not prevent the infiltration of water into the wells, and does not itself offer a very serviceable filtering medium. Its cost would be about Rs. 250 for each well if the concrete were 1½ feet thick round the stone or brick steining, and about Rs. 160 more for every extra foot of thickness.

If intended as a platform round the well, 20 feet wide, the cost would be Rs. 350 for every foot in depth.

Almost all the wells in cantonments have dressed trap-stone pavements, from 6 to 10 feet wide, bedded in rammed moorum or concrete, with an edging of trap-stone about 6 inches high, outlet drains being provided.

The natural method of using the waste water would be to water plants or trees with it. No lengthening of outlet drains would be so effective as this.

It may here be noted that where bath-room or waste water from kitchens and wells lies, luxuriant crops of grass can be obtained even in the hottest weather, and where this occurs there is usually much less smell than where the water runs down open drains to form a pool at the end.

IV.—Leakage and protection from drift rain—

(*f*) The roofs of some of the barracks leak occasionally, owing to the loosening of the rivets and bolts in the corrugated iron coverings, as well as from the rain drifting in at the ventilators.

The bolts are tightened up now and then, and the leakage at the ventilators could be in some degree obviated by placing perforated zinc screens in the rather wide openings.

For Nos. 4 and 5 European Infantry Barracks this would cost about Rs. 1,500.

(g) The west verandahs of Nos. 4 and 5 European Infantry barracks in the upper storey are protected from drift rain by sliding venetian shutters, in much the same plan as that provided for the Cavalry Hospital.

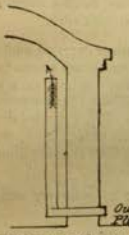
To provide the west verandahs of Nos. 3, 4 and 5 Cavalry barracks with similar venetians would cost about Rs. 3 × 1,100 = Rs. 3,300.

If the east verandahs are to be protected in the same way the cost for the 5 barracks above mentioned would be about

5 × 1,100 = Rs. 5,500 more.

V.—Ventilation—

(h) Of the domed or vaulted Royal Artillery barracks.



The simplest method would be to knock more holes at intervals in the crowns of the arches, and provide them with cowls and ventilating shafts. This would have to be done in the verandahs as well as in the main rooms. More ridge ventilation might also be given to the outer corrugated iron covering. Wall ventilation under the springing line of the vaulting might also be given. There would probably be sanitary objections to placing pipes in the outer walling, and allowing the air to rise in an iron tube placed inside the walls nearly to the height of the roof.

The probable cost would be Rs. 3,000.

(i) The ventilation of the kitchens might be carried out in a similar way as petty works.

(j) The Cavalry urinaries have honeycombed sides as in the European Infantry urinaries.

Probable cost Rs. 1,500 of further ventilation.

VI.—If the latrines be dismantled and rebuilt separate from the kitchens of the staff serjeants' quarters, the probable cost would be Rs. 150 for each staff serjeant.

VII.—Cement or lime plaster under urinals in the verandahs is useless, as Dr. Hewlett objects to urine in contact with them. Glazed earthenware or coal-tarred iron saucers would answer perhaps.

For the filters similar stands might be provided if the existing terracing or stone pavement is not considered impervious enough.

These articles would probably be supplied by the Commissariat Department.

VIII.—Iron cisterns are, it is believed, being supplied to kitchens by the Commissariat Department.

IX.—The objections to the present arrangements have been considered above under "Surface drainage".

X.—The water-supply scheme awaits the sanction of Government.

XI.—The rough estimate for supplying water from well No. 43 and its neighbourhood to the barracks is herewith sent.

The total approximate cost is given below under the several heads :—

I.—Sub-soil Drainage.

	Rs.
(a) Of the ground south-west of European Infantry barracks	9,135

(b).—*Near Barracks.*

	Rs.	Rs.	Rs.
Nos. 3, 4 and 5 Cavalry barracks ...	2,331		
Nos. 4 and 5 European Infantry barracks	1,787		
Nos. 1 and 2 Royal Artillery do.	1,001	... 5,119	
			14,254

II.—Digging up floors of

Cavalry and European Infantry barracks ...	...		55,566

III.—Surface Drainage (not estimated).

IV.—Protection from drift rain.

Ventilators Nos. 4 and 5 European Infantry barracks	... 1,500	
,, for west verandah Nos. 3, 4 and 5 Cavalry barracks	... 3,300	
East verandahs of Nos. 4 and 5 European Infantry and Nos. 3, 4 and 5 Cavalry barracks ...	... 5,500	
		10,300

V.—Ventilators.

(h) Ridge ventilation, Royal Artillery barracks	... 3,000	
(j) Ventilation of Cavalry urinaries ...	... 1,500	
		4,500

VI.—Separate latrines for Staff Serjeants' Quarters (4 European Infantry, 4 Cavalry, and 2 Heavy Field Battery) = No. 10 × 150 — 1,500

7, 8 and 9—cost not estimated.

Grand Total Rs. ... 86,120

X.—Water-supply, Baircha scheme.

	Rs.	a.	p.
Bund	... 1,54,815	0	0
Waste weir	... 84,531	10	10
Outlet works	... 16,990	0	0
Service reservoirs on European Infantry Hill, Mhow	... 44,063	11	0
10-inch main from tank to service reservoir	... 1,46,675	14	0
Pipe distribution in Mhow	... 1,21,033	15	3
Compensation to Baircha	... 2,102	0	0
Assistant Engineer's bangalow ...	... 1,229	0	0
Total	... 5,71,441	3	1

XI.—Water-supply.

	Rs.	Rs.
From ground near well No. 43 ...	1,43,200	
Add—5 wells extra @ 2,000 each ...	10,000	
		1,53,200

G. R. GIBBS, Major, S. C.,
Executive Engineer, Mhow Division.

Mhow, the 12th June 1883.

B.

REPORT IN COMPLIANCE WITH ASSISTANT QUARTER MASTER GENERAL'S No. $\frac{13-F}{18.6}$ DATED 31ST MAY 1883.

On Extract 1 (from Sanitary Commissioner's Report).

Hospital *privies* for patients.—In the plan of these I do not see room for improvement. The privy compartments are each about 10 feet long between the narrow doorways and the one seat. A soldier sitting down can certainly be caught a glimpse of by a passer-by inside the passage, but only momentarily.

As woodwork is undesirable in latrines, I object to doors; and there are obvious reasons against making the compartments convertible into cells.

The *bath* rooms for venereal patients are without doors, but brick partitions provide sufficiently for decency.

The 2 houses for bathing and washing, referred to, have each a separate entrance from the hospital verandah, and they are entirely detached buildings as regards the privies.

The drains mentioned by the Sanitary Commissioner run 130 yards to the boundary wall, and there end. They convey soap and water only, and the stagnation at the outlets is a very small affair, not needing remark—the liquid being soon disposed of by evaporation and absorption into waste and sloping-away ground.

On Extract 2.

The hospital, formerly used for women, is only occupied when the main building for men overflows with sick—say for 3 or 4 months only of the year during the rainy season.

The bath-room drain conveys wash-water and soap merely. I have noted the place of termination of the drain: the ground there has a declivity; consequently stagnation could hardly occur. Taking into account the quantity and quality of the bath-room drainage, the power of the sun, and the distance of well 28, together with the contour of the ground surface and disinfecting power of earth, it appears to me absolutely incredible that No. 28 well water can be in any way alterable by the drainage in question.

On Extract 3.

Auxiliary Hospital latrine for natives.—I have specially inspected this hut, and cannot confirm the opinion that it is badly ventilated, and not good enough for the people and purpose considered. As it is impossible to make native men and children behave tidily in a latrine, I do not see what interior re-arrangement would be better or necessary, provided the mehtars in charge are properly supervised.

One side of the hut is allotted, I understand, to women and children (3 seats) and the other to men (2 seats): about 20, in all, frequent the hut. Partitioned off from the recesses for solid excreta are 2 compartments, each for micturition and ablution. These drain into a removable iron tank (made stupidly a fixture by an overhanging drain spout!) which is daily baled out.

The distance of this latrine from well 14 is about 145 yards, and it is difficult to imagine that the diameter of the inverted conical collecting area of that well can reach nearer to the latrine than about half the distance.

On Extract 4.

Standing on the spot, and reading this extract, the objection expressed seems hypercritical. It appears to me that no better arrangement for the disposal of the wash-house drainage could be carried out.

The Auxiliary Hospital is used in the rains and autumn only—say for 4 months of the year. The drains then convey the soap and water flow amply diluted with rain water, well away (100 yards?) from the hospital into broken ground, which slopes away to a roadside gutter. There is no place apparently to lodge a pool in, and it is unlikely there will be anything noisome in the drain liquid.

Station Hospital, Mhow,
9th June 1883.

A. F. BRADSHAW,
Brigade Surgeon.

Note.—Surgeon Major Taylor has been for some months past responsible for the sanitation of the Auxiliary and New Women's Hospital, and his report is attached hereto.

B.—1.

Return of Admissions into Hospital and Deaths among the British Corps at Mhow between the 1st of April 1881 and the 1st of April 1883.

Number of Months in Mhow in the 2 years.	Corps.	Average Strength.	Average Number of Daily Sick for the 2 years.	Number of Daily Sick per 1,000 of Strength for the 2 years.	Number of Deaths.	Died per 1,000 of Strength.	Admitted into Hospital per 1,000 of Average Strength.								Total of all Admissions in 2 years.	Admission Rate per 1,000 of Strength.	Causes of Deaths in Hospital.							Wounds and Accidents.	Invalided Deaths and other Deaths out of Hospital.
							Cholera.	Enteric Fever.	Other Fevers.	Dysentery.	Diarrhœa.	Hepatitis.	Spleen Diseases.	Venereal Diseases.			Cholera.	Enteric Fever.	Malarial Fevers.	Dysentery.	Diarrhœa.	Hepatitis.	Other Causes.		
24	17th Lancers	420·87	25·26	60·01	6	14·25	...	...	1,195·11	7·12	42·76	35·64	...	280·37	1,159	2,753·81		1	...	...	...	...	1	1	3
8	D/B Royal Horse Artillery.	191·12	15·5	81·10	...	...	...	...	397·65	109·87	10·46	20·92	...	167·43	222	1,161·57	...	...	...	...	...	...	...	...	...
14	A/4 Royal Artillery ..	132·64	6·44	48·55	1	7·53	...	...	633·29	...	37·69	52·77	30·15	271·41	205	1,545·53	...	...	...	...	...	1	...	...	...
24	5/1 Royal Artillery ...	102·5	4·45	43·41	...	...	...	...	551·70	...	...	58·53	9·75	331·70	196	1,912·22	...	...	...	...	...	...	...	...	...
17	2nd Lancashire Fusiliers.	633·1	54·44	85·98	6	9·47	...	6·31	835·57	14·21	99·51	25·27	6·32	586·00	1,712	2,546·20	...	1	...	...	...	...	1	2	2
7	1st Worcestershire ...	702·12	64·06	91·23	3	4·27	...	1·42	595·33	2·84	25·63	2·84	1·42	217·91	805	1,146·52	...	1	...	...	...	...	2	...	...

N.B.—This table shows the actual extent of sickness in the regiments and batteries named during the months of their stay in Mhow between the dates given.
For the numbers of admissions for each of the diseases, see table in next page.

A. F. BRADSHAW,
Brigade Surgeon.

Table of Admissions between April 1st, 1881, and April 1st, 1883.	17th Lancers.	D/B Royal Horse Artillery.	A/4 Royal Artillery.	5/1 R yal Artillery.	2nd Lancashire Fusiliers.	1st Worcestershire.	Total.
Cholera	...	...	...	...	...	...	...
Enteric fever	...	...	...	...	4	1	5
Other fevers	503	76	84	56	529	418	1,666
Dysentery	3	21	...	...	9	2	35
Diarrhœa	18	2	5	...	63	18	106
Hepatitis	15	4	7	6	16	2	50
Spleen diseases ...	...	...	4	1	4	1	10
Venereal diseases ...	118	32	36	34	371	153	744
Months of stay in Mhow	24	8	14	24	17	7	...
Total admissions in 2 years from all causes.	1,159	222	205	196	1,712	805	4,299

C.

FROM

SURGEON-MAJOR TAYLOR,
In medical charge No. III District;

To

THE BRIGADE SURGEON,
Station Hospital.

Mhow, 5th June 1883.

SIR,

With reference to Deputy Surgeon General Hewlett's remarks on the Auxiliary Hospital latrine for natives and the open drains from the wash-house, I would respectfully express the opinion that I see no danger from either of them. From the nature of ground, on to which the open drains lead, it is impossible that any unsanitary conditions could arise from the waste water.

I have the honour to be,
Sir,
Your obedient Servant,
W. TAYLOR, M.D.,
Surgeon Major.

D.

No. $\frac{C.4}{1883}$.

Mhow, 8th June 1883.

FROM

THE ASSISTANT COMMISSARY GENERAL,
Mhow;

To

THE ASSISTANT QUARTER MASTER GENERAL,
Mhow Division Army,
Mhow.

Your No. $\frac{B.3}{1883}$. dated 31st ultimo.

SIR,

In acknowledging the receipt of your memorandum quoted above, I have the honour to report that a steam bakery, wherein the whole process of bread-making can be carried out by machinery, is most desirable, particularly in a sanitary point of view, for the following reasons.

2. The dough at present is kneaded by hand—a most objectionable system, particularly in the hot season when perspiration streams from the bodies of the men who knead the bread; and notwithstanding the great care, and that all the men are dressed in white clothing, the sweat falls from the men's faces and hands into the dough, and it is difficult, if not impossible, to prevent this.

3. There is a bakery in a small station like Karáchi, where there is, I believe, only 1 Battery of Artillery and head-quarters, and wing of a European regiment, while the strength of the Mhow Garrison is as per margin. Besides, by the introduction of the steam bakery, this Executive will be in a position to supply flour, 2nd sort, to the 38 transport and battery elephants at this station; also to supply articles, as per margin, to Neemuch, Nasirabad and Asirgarh, thus effecting a considerable saving to Government.

A/4 Royal Artillery.
5/1 Royal Artillery, North Irish Division.
17th Lancers.
(7) seven companies European Regiment, including (1) one at Indore.

Biscuit.
Bean.
Rolong or suji.
Flour, 1st sort.
" 2nd sort.

4. As the subject, as above stated, is undoubtedly of great importance, I would urgently, in the interest of the State and the soldier, solicit that the sanction of Government to the erection of a steam bakery at this station may be obtained.

5. With reference to the extra issue of vegetables to troops, I would observe that the sanction of Government is necessary.

6. I regret the delay that has occurred in submitting this report, and which is due to references having to be made to former correspondence on the subject.

I have the honour to be,
Sir,
Your most obedient Servant,
C. SWINHOE, Colonel,
Assistant Commissary General,
Mhow Division.

E.

No. $\frac{163}{M}$ OF 1883.

Cantonment Magistrate's Office,
Mhow, 1st June 1883.

FROM

THE CANTONMENT MAGISTRATE,

TO

THE ASSISTANT QUARTER MASTER GENERAL,
Mhow Division,
Mhow.

SIR,

In reply to your No. $\frac{12-3}{1879}$ I have the honour to inform you that both the villages of Gowlipura are under my supervision for sanitary purposes, although one of them is in Holkar's territory. They are at present clean, whatever they may have been when the sanitary report was made out. They are visited by the conservancy serjeant twice a week.

With regard to the food of the milch cows, no litter is allowed to be sold from the bázár for the purpose of feeding cows, though how the Artillery and Cavalry dispose of their stable refuse I am unable to say.

I have the honour to be,
Sir,
Your most obedient Servant,
W. S. PEAT, Major,
Cantonment Magistrate.

Abstract of Cost for converting all the Bázár Public Latrines into Colonel Goodfellow Royal Engineer's Pattern as recommended by Sanitary Commissioner, Deputy Surgeon General Hewlett.

Description.	Quantity.	Rate.	Amount.	Total.	Remarks.
		Rs. a.	Rs. a. p.	Rs. a. p.	
Seats for male and female in present latrines ...	239	Each 17 8	4,182 8 0		
Contingencies for Rs. ...	4,183	5 per cent.	209 2 4	4,391 10 4	
Cost for single tile roof for the above seats.					
Latrine seats for male and female	239	Each 5 8	1,434 0 0		
Deduct for the old materials which can be used in the above said roofing from the present latrines, about Rs. ...	...	...	400 0 0		
			1,034 0 0		
Contingencies for Rs. ...	1,034	5 per cent.	51 11 0	1,085 11 0	
Grand Total Rs. ...	...	...	.....	5,477 5 4	

MAHOMED ABDULLAH,
C. C. Overseer.

W. ASHFIELD, Captain,
Secretary, Cantonment Committee.

Mhow, 12*th June* 1883.

Estimate for removing the Nightsoil from Bázár Private Latrines to Bázár Filth Yard by Cantonment Committee Establishment.

Description.	Quantity.	Rate.	Amount.	Total.	Remarks.
		Rs. a.	Rs. a. p.	Rs. a. p.	
New Allahabad filth carts	8	Each 150 0	1,200 0 0	.....	
Extra receptacles for depositing filth	16	5 8	88 0 0	.....	
Extra iron buckets ...	16	Each 2 0	32 0 0	1,320 0 0	
Contingencies for Rs. ...	1,320	5 per cent.	.....	66 0 0	
				1,386 0 0	Rs. 1,386-0-0.
Buffaloes with drivers for one year, monthly ...	Pairs. 8	10 per month.	80 0 0	960 0 0	Yearly.
Average cost for repairing carts, &c.	8	Each 20 0	.....	160 0 0	Yearly.
Yearly expenditure ...	...	...	.....	1,120 0 0	
Grand Total Rs. ...	...	...	.....	2,506 0 0	

MAHOMED ABDOOLAH,
C. C. Overseer.

W. ASHFIELD, Captain,
Secretary, Cantonment Committee.

Mhow, 12*th June* 1883.

No. 2230 OF 1883.

SANITARY DEPARTMENT.

FROM

THE SANITARY COMMISSIONER WITH THE GOVERNMENT OF BOMBAY,

TO

THE MILITARY SECRETARY TO GOVERNMENT.

Camp Poona, July 27th, 1883.

SIR,

In forwarding to you, for submission to His Excellency the Governor in Council, my Inspection Report on the Cantonment of Mhow with the remarks of the Cantonment Committee and their accompaniments on the proposals therein made, I have, in accordance with the instructions conveyed in para. 15 of Government Resolution, General Department, No. 2617, dated 23rd August 1876, the honour to make the following observations :—

2. No. 1, page 2 of the report—boundary line—

I am fully aware of the great difficulties the Lieutenant-General Commanding the Mhow Division has to encounter from the cantonment being surrounded with filthy villages which are in foreign territory. My object in bringing them to prominent notice was to show the great mistake that has been made, in Mhow as well as in other cantonments, of, when the cantonment was first established, not having included within the boundary line all places which from their position and the character of their inhabitants are likely to affect the sanitary condition of troops. These disease causes are, as regard Mhow, now probably irremediable ; but, if the attention of the authorities is forcibly drawn to the subject, similar mistakes as regards new cantonments, which may hereafter be formed, will be avoided and sufficient space will be left around a cantonment to provide for future contingencies should it expand.

3. No. 2, page 5, para. 2, &c.—

I am glad to learn that this and several other matters brought to notice in the report have been or will be remedied.

4. No. 10, page 9—Heavy Battery—

In reply to the remarks of the Lieutenant-General, I have the honour to observe that in estimating disease statistics it is necessary to take into account the admission rate per 1,000 of strength as well as the daily sick rate. Judged by the admission rate the men of the Heavy Battery, although the most stalwart men in the station and of vastly more powerful physique than any of the other troops in Mhow, had a higher rate of admissions than the men belonging to other batteries and the men of the 1st Worcestershire Regiment.

	Admission Rate per 1,000 of Strength.
D/B, Royal Horse Artillery	1,161·37.
A/4, Royal Artillery	1,545·53.
5/1, Royal Artillery	1,912·22.
Worcestershire Regiment	1,146·52.

It is also necessary to observe that the periods of residence, in the cantonment, of the corps just named did not equal that of the 5/1 Royal Artillery,—the only corps which was in the station for an equal period being the 17th Lancers ; but in contrasting the admission rate of these two corps I quite allow it is to be expected that it will be highest in the Lancers, as the men of the 5/1 Royal Artillery arrived in India in December 1875, and were, therefore, acclimatised, whilst the Lancers arrived in India in November 1879, and as a regiment recently arrived in the country was, consequently, more predisposed to disease ; but no corps with an

admission rate of 1,912 per 1,000, as the 5/1 Royal Artillery had, can be considered healthy. The average strength of the 5/1 Royal Artillery was lower than any other corps, and its average daily sick rate is naturally the lowest.

5. The Brigade Surgeon's letter on No. 18, &c.—

I have the honour to state that I saw some of the privy compartments at the Station Hospital without any door or partition wall in front, so that men sitting on the seats must be open to the full view of any one passing in front of them. This appears to me to be indecent.

With reference to his remarks about the drains leading from the wash-houses at the Station and Auxiliary Hospitals, I think Dr. Bradshaw, who did not arrive at Mhow until after the rains, would not have made them if he had seen the condition of these places as I saw them in September. The sun during September (one of the fever months) is frequently obscured by clouds, and there is, comparatively speaking, but little evaporation, and this water gradually disappears by subsidence into the earth. At the Station Hospital this takes place in the immediate neighbourhood of the old Female Hospital, which was full of patients at the time of my visit, and there was, as stated in the report, an offensive pool outside the wall of the compound of the Auxiliary Hospital. Such disposal is, in my opinion, an added disease cause. It is quite true that the drains end a long way above the wells referred to; yet with the history of enteric fever in Mhow, foul dampness near hospitals, and in the case of the Auxiliary Hospital to windward of it, is most undesirable, and no such practice ought to be allowed, in my opinion, on the gathering ground of wells.

Regarding his remarks about the servants' latrine at the Auxiliary Hospital, I very much doubt the possibility of keeping any privy clean where the nightsoil does not fall into any receptacle, but on to earth between the seats; and this is especially dangerous, in my opinion, at Mhow, as this privy is on the watershed of the well from which the Cavalry draw their water-supply. If the nightsoil becomes desiccated it is by no means impossible that particles of it may be blown about by the wind. The smell in it at the time of my visit was great, and I do not consider it sufficiently ventilated.

It is one of the worst privies I am acquainted with, and it is surely degrading to make a native after the act of defæcation walk uncleansed round to a place at the back to wash his person. The arrangements in it are far inferior to the standard plan sanctioned by Government. In my opinion the privy should be removed.

6. No. 20, page 7—

I am glad to learn that new garrison cells are in course of erection.

7. No. 21, page 19—

In the face of recent legislation in England regarding the Contagious Diseases Act, I think any further action as to the extension of its provisions in India is hopeless, as I look upon its abolition in India as now nearly certain.

8. No. 22, page 19—water-supply—

Regarding the remarks of the Cantonment Committee with reference to my proposals for extending the water-supply, I have the honour to observe that, as stated in the report, I entirely concur with the Committee in thinking that by far the best plan would be to carry out the scheme proposed by the Engineer, and my proposal to sink wells to the south of the general parade-ground was confessedly a make-shift, and only indicated where I considered the purest well water would most likely be found.

I learn from the Executive Engineer's estimate that sinking wells in this site would cost Rs. 1,53,000; and I would much prefer to see this sum spent in the construction of the Baircha Lake. I must, however, notice the remark of the Committee that the place I propose is supposed by me to be the main source of Mhow Cantonment malaria. The Committee have evidently misunderstood the question. In the report I stated the cause of the malaria which affects the Infantry is, in my opinion, the waterlogged condition of the valley on the south of the cantonment and between it and the Vindya Mountains in which the headwaters of the Sátia River take their rise. The place where I propose that any new wells should be sunk, is along the edge of the water-bearing rock forming the general

parade-ground, and the water in them would be of the same good quality as that found in wells Nos. 41 and 42. No water would come from the valley, but would drain through the soil of the higher ground above, and pass through the wells on its way down to the valley.

Since writing the report I have received Government Resolution in the Military Department, No. 2600, dated 20th May 1883, in which the storage of rain water in closed tanks is proposed.

This water would, I presume, be collected from the roofs of the barracks: if so, the first washings of the roofs would have to be rejected, as they are fouled by kites and other birds, and sometimes much vegetation is found on them if they consist of tiles. I regret that I have been unable to find an account, which I have a distinct recollection was published some years ago, of an experiment of the kind being made in some station in Bengal where it failed. It was, too, I believe proposed to erect sheds with a large superficies of glass so as to get a large catchment, but I am not sure if this plan was carried out. If the gathering surface can be kept clean, I have no doubt it would provide a most valuable source of pure drinking water, and I think it is well worth trial if money cannot be found for the big scheme.

The storage tanks should, I think, be placed as far away as possible from the buildings, where there is less chance of the water becoming impure from the absorption of ammonia, and it would be well for the Engineers to read over what Dr. Parkes has to say on the subject before they frame their plans and estimates:—

"As far as possible all reservoirs, tanks, &c., should be covered in and ventilated; in form they should be deep rather than extended, so as to lessen evaporation and secure coolness. They should be periodically and carefully cleaned. Tanks to hold rain water require constant inspection."

This scheme would not, however, provide for the wants of the Sadar Bázár, where the present supply is most impure. The Government of India are prepared to sanction an allotment of 3 lákhs, and, perhaps, the Cantonment Committee may be able to raise the remaining 3 lákhs in the open market. If this could only be done, the perfect scheme could be carried out, and the civil as well as the military population of Mhow would not only have one of the best insurances against disease, but it would also be possible to complete a drainage and sewerage scheme, and to water the roads, &c., &c.

9. No. 26, page 23, para. 7.—Wells Nos. 14 and 15 supplying the Cavalry.

Regarding the remarks of the Cantonment Committee, I have the honour to state that, as the analyses were made at the season of the year when the water was probably in its purest condition, I formed the opinion expressed in the report after careful consideration of all the circumstances and on my experience of similar cases. All sanitary experience convinced me that at any moment these wells may become impregnated with dangerous matter, and I still retain the belief that they are unsafe sources of drinking water.

10. No. 27, page 23, last para.—Library well No. 22. This well does not contain the purest water in camp, but it undoubtedly contains good water, and my anxiety is to preserve its purity. I am, therefore, glad to learn that, at all events, the servants' privy, complained of, is to be removed from its present site, which is in dangerous proximity to the well.

If enteric fever again appears among the Cavalry I most strongly advise the authorities to bear my recommendation in mind, and to allow their drinking water to be drawn from this well, and not from wells 14 and 15.

11. No. 30, last para. of page 24, and para. 4, page 25, advocating the disuse of leathern mussocks and the substitution of galvanized zinc vessels for the troops.

The remarks of the Lieutenant-General apply to field service, but would seem not necessarily applicable to times of peace. The danger of the bhisti's mussock has been noticed in each report I have written, and is established both by the analyses and the microscope. If it is impossible to devise, which I do not think it is, a zinc vessel light enough to be carried by men on the line of

march, surely it would not be a difficult matter to construct one which could be carried by ponies or mules.

12. No. 42, page 39, Conservancy of Regimental Lines, &c.—With reference to the remarks about the manure yard, I think the Cantonment Committee have misunderstood my recommendation.

I do not object to the present central position of the Sadar Bázár manure yard; but I do object to the site of the regimental manure yard, as it is too near and to windward of the village of Gujia Khera, and in too close proximity to some of the wells from which the villagers draw their water. I suggested that the nightsoil, &c., from the barracks be taken to the same place as that from the bázár, so that there should be only one manure yard for the whole station. This yard is central, and is nearer to the barracks than the present military yard. It is, in my opinion, better to have all this offensive matter in one place and dealt with under one management.

I am glad to learn that the village of Pensionpura will in course of time be removed, but it ought never to have been allowed to exist.

13. No. 43, page 40, Sadar Bázár—

The good that the surface drainage will eventually effect, is acknowledged in the report, and when it is completed it will be an important sanitary improvement. At present, as the drains end any where and their contents are discharged on to the ground, its condition intensifies the danger.

Regarding the remark with reference to page 47, para. 4 of the report, that there is no known law by which a person can be compelled to build a privy, I hope that Government will be pleased to order the Cantonment Act to be amended, so as to give this very necessary power to Cantonment Committees.*

14. The remarks in the attached report by Major Gibbs, the Executive Engineer, are most valuable.

Sub-soil drainage.—By the estimate I see that the filling the trenches, by which it is proposed to intercept the sub-soil water from the barracks with sand, is the heaviest item.

Perhaps he can suggest a cheaper and equally good material. If a tile pipe, such as is recommended by the great American authority, Mr. Waring, in his excellent work on drainage for profit and health, were placed at the bottom of the trench whilst it were filled with broken tiles it might perhaps be a cheaper arrangement. It might be well to await the effect of the sub-soil intercepting trenches before going to the expense of digging up the floors of the barracks, which is estimated to cost a very large sum.

Surface drainage.—I am glad to see that Major Gibbs condemns, from an engineering point of view, as strongly as I do the present system of disposing of the waste water by open masonry drains running to some distance from the buildings, the water running on to the ground. His remarks on the evils attendant on this system are so convincing that I have nothing further to say.

With reference to his remarks on what I said about cesspools holding bath-room water, and his proposal to allow this water to flow over kitchen or flower gardens, I have the honour to observe that, however well this plan could answer in some stations, and I recommended it in my report in 1876 for the barracks at Wanouri, yet, with the previous history of the ground on which the new Cavalry barracks at Mhow stand, I should be sorry to see it applied there; for it will be remembered that this ground was formerly occupied by the lines of a Native Infantry Regiment, and such a practice, recollecting the experiences of Nasirabad, would, in my opinion, be dangerous. No water, which has been fouled, should be allowed to flow out over the gathering ground of the wells. For these reasons I hope Major Gibbs' proposals will not be sanctioned.

* I find that under Bengal Act XXII of 1864, which applies to Mhow and which corresponds to Bombay Act III of 1867, the Cantonment Magistrate has power to cause latrines to be constructed at private premises.

All refuse water, whether from bath-rooms or kitchens, could, if there were only a sufficient amount of water, be made to convey itself away through glazed stone or earthenware pipes to a perfectly safe site. Such a plan would be far cheaper than by hand removal; but, until such times as a water-supply is provided, it must be carried away. Instead of cesspools, which are always a source of danger, the bath-room water should be discharged into an iron receptacle, such as a cart, or, if the spout of the bath-room on the ground floor is too low to admit of a cart standing under it, into a low, but long, iron receptacle resting on the surface of the ground, or, still better, direct into a bhisti's puckal.

Wells.—Recommendation that all wells have an external casing of concrete round the masonry or brick tubing to a depth of 20 feet.

The perusal of Major Gibbs' remarks on this recommendation leads to the irresistible conclusion that he has not had access to, or has not read the memoranda which are annually sent to India by the Army Sanitary Commission. If these invaluable documents have not been sent to him, I respectfully submit that he should be furnished with copies, for he would then see that, for many years past, this course has been recommended by the highest authority on the subject.

If he had read their suggestions he would not have imagined that I had proposed that a platform of concrete, 20 feet *wide*, should have been made around each well. I would beg to refer Major Gibbs to Vol. XI of the Sanitary Measures in India in 1877-78, at page 217 of which he will find a full description of what is required. As the surface rock at Mhow is so porous and absorbent, I recommend that the external casing of concrete round the tube should be carried down for a depth of 20 feet, so as to ensure that amount of filtration through the soil. If, as Major Gibbs says, the concrete made at Mhow is porous and absorbent, hydraulic cement or even puddled clay may be used. Cement is the safest. The wastage water from wells may be safely used for watering trees or gardens; but it should not, as is too often observed at Mhow, be allowed to stagnate near wells.

Leakage and drift-rain in barracks.—I am glad to see that Major Gibbs' attention has been directed to this subject. There is nothing more dangerous than a damp barrack, and at all hazards the roofs ought to be made water-tight, and the rain prevented from drifting in.

Ventilation.—If the Heavy Battery barracks are, in spite of their sanitarily dangerous construction, to be maintained, I agree with Major Gibbs that, unless the plan I suggested be carried out, the best plan would be to knock more holes at intervals in the crown of the arches, and provide them with cowls and ventilating shafts both in the verandahs and main rooms.

Cavalry urinals.—The amount estimated for the ventilation of Cavalry urinals—Rs. 1,500—appears very large when one remembers a privy on the Goodfellow latrine system can be put up at a cost of from Rs. 25 a seat.

Pavements below filters.—An impervious platform, whether of asphalte or other material, is required and a pipe leading to a downtake. The damp condition around filter stands is dangerous. I do not see how the Commissariat Department can be expected to remedy what is essentially an engineering point.

I have the honour to be,
Sir,
Your most obedient Servant,

T. G. HEWLETT,
Deputy Surgeon General,
Sanitary Commissioner.

APPENDICES.

a 997—1 ap

Annual Form No. I.—BIRTHS *registered in the* Districts *of the* Bombay Presidency *during the year* 1882.

1	2	3	4			5			6	7	8
No.	Districts.	Population according to Census of 1881.	Number of Births registered.			Ratio of Births per 1,000 of Population.			Number of Males born to every 100 Females born.	Excess of Births over Deaths per 1,000 of Population.	Excess of Deaths over Births per 1,000 of Population.
			Male.	Female.	Total.	Male.	Female.	Total.			
	Northern Deccan Division.										
1	Khándesh	1,337,391	25,442	20,672	46,114	35·43	34·19	34·80	108·56	13·79	....
2	Násik	741,206	14,370	12,158	27,473	36·18	34·27	35·17	108·97	10·40	....
3	Ahmednagar	701,788	15,092	14,164	29,256	39·44	38·78	39·12	106·91	19·61	....
4	Poona	909,621	19,057	17,897	36,754	39·69	39·25	39·48	111·63	9·04	....
5	Sholápur	362,487	10,190	9,049	20,139	54·26	54·58	54·07	102·42	13·56	....
	Southern Deccan Division.										
6	Sátára	1,008,320	21,262	20,215	41,477	40·96	39·15	40·05	108·28	16·41	....
7	Belgaum	864,014	16,189	15,866	32,477	38·18	36·99	37·58	104·41	19·43	....
8	Dhárwár	482,907	10,671	17,564	28,235	42·24	39·91	41·06	106·12	19·80	....
9	Kolábá	625,405	11,567	11,111	22,678	36·42	34·93	35·67	104·10	19·42	....
	Konkan Division.										
10	Kánara	431,940	6,481	6,164	12,625	28·97	31·00	29·96	104·82	4·72	....
11	Ratnágirí	907,000	19,822	9,050	29,622	23·98	28·79	26·63	110·43	6·60	....
12	Kolába	551,169	6,815	6,625	13,440	27·19	27·38	27·28	102·86	4·98	....
13	Bombay City	773,196	7,812	7,292	15,004	16·81	23·87	19·39	107·14	....	8·63
14	Thána	906,548	13,317	13,581	26,898	26·44	29·97	28·26	106·45	0·43	....
	Gujarát Division.										
15	Surat	614,196	11,891	10,739	21,633	34·21	34·99	35·55	102·90	12·74	....
16	Broach	309,366	6,888	5,196	12,083	39·84	34·12	36·95	109·99	9·29	....
17	Kaira	904,990	14,642	12,096	26,441	32·21	27·79	32·05	111·90	19·02	....
18	Panch Mahals	357,479	5,067	3,946	9,013	27·10	20·11	26·07	109·29	12·69	....
19	Ahmedabad	836,324	12,316	11,176	23,492	27·90	26·61	27·26	109·71	9·12	....
	Sind Division.										
20	Karáchi	473,868	5,480	4,391	9,871	20·63	20·64	20·63	124·80	2·22	....
21	Hyderabad	754,024	5,983	3,879	9,787	12·49	10·59	11·61	138·30	....	3·26
22	Thar and Párkar	209,344	2,886	2,196	5,082	20·64	24·12	24·39	109·99	7·69	....
23	Shikárpur	837,896	9,214	7,615	17,329	21·07	19·43	20·22	127·55	....	0·65
24	Upper Sind Frontier	194,181	773	530	1,303	11·05	9·01	10·04	146·23	0·61	....
	Total for the Presidency	16,454,414	258,027	235,419	491,546	30·15	29·89	29·90	109·73	8·29	....

Annual Form No. II.—DEATHS *registered in the* Districts *of the* Bombay Presidency *during the year* 1882.

1	2	3	4	5			6	7			8		
No.	Districts.	Area in Square Miles.	Average Population per Square Mile.	Number of Deaths registered.			Number of Males died to every 100 Deaths of Females.	Ratio of Deaths per 1,000 of Population.			Mean Ratio of Deaths per 1,000 during Previous Five Years.		
				Male.	Female.	Total.		Male.	Female.	Total.	Male.	Female.	Total.
	Northern Deccan Division.												
1	Khándesh	8,944	154·42	14,651	13,693	27,304	115·71	23·10	20·99	22·07	25·26	23·19	24·71
2	Násik	5,940	151·61	10,154	9,195	19,349	110·42	25·58	23·06	24·77	29·61	27·27	28·42
3	Ahmednagar	6,606	112·69	7,852	7,000	14,852	109·72	20·05	18·05	19·01	30·56	27·17	28·79
4	Poona	5,348	169·40	8,400	7,971	16,371	109·06	18·48	17·72	17·94	24·82	22·27	23·47
5	Sholápur	4,531	128·84	5,822	5,581	11,003	111·49	19·78	19·18	19·99	32·66	33·00	33·01
	Southern Deccan Division.												
6	Sátára	4,893	212·26	12,249	11,687	24,235	105·66	22·19	23·06	22·62	31·44	27·22	29·71
7	Belgaum	4,607	187·57	10,611	9,504	20,015	110·39	24·19	22·31	23·24	42·25	36·62	39·72
8	Dhárwár	4,850	194·69	10,151	9,607	19,958	103·20	27·91	27·34	27·59	41·72	36·30	39·28
9	Kolábá	5,757	119·99	8,296	8,266	16,562	100·70	19·83	19·27	19·50	41·39	34·92	38·09
	Konkan Division.												
10	Kánara	5,011	107·45	5,751	5,603	10,360	113·54	25·73	25·41	25·61	30·34	29·65	27·99
11	Ratnágirí	5,922	264·23	7,140	6,997	14,137	112·23	16·96	19·16	14·89	23·99	21·22	19·71
12	Kolába	1,696	256·15	3,003	3,079	7,077	112·85	20·04	17·58	18·97	19·71	17·74	18·87
13	Bombay City	22	35,136·27	10,054	9,035	19,089	111·24	29·04	24·18	26·74	24·79	23·29	24·23
14	Thána	4,249	214·12	10,949	9,122	20,071	106·45	22·19	17·05	19·60	23·91	22·28	23·22
	Gujarát Division.												
15	Surat	1,602	382·05	7,208	6,643	14,007	119·05	21·04	21·87	22·21	29·64	27·66	28·85
16	Broach	1,453	213·07	5,021	3,263	8,284	113·75	21·74	17·21	20·55	30·03	32·17	34·31
17	Kaira	1,939	466·19	9,779	8,171	17,950	119·62	22·26	21·63	22·13	23·05	20·21	21·67
18	Panch Mahals	1,833	195·03	3,395	1,973	4,968	117·76	18·83	13·06	17·96	20·61	24·26	27·46
19	Ahmedabad	3,933	214·10	11,186	9,569	20,755	116·91	25·23	22·96	24·24	30·62	30·86	31·49
	Sind Division.												
20	Karáchi	14,115	33·71	5,014	3,793	8,807	132·19	16·95	17·97	18·40	17·79	15·62	16·69
21	Hyderabad	9,220	81·87	6,302	4,694	11,000	134·24	13·48	13·01	14·58	12·37	11·13	12·05
22	Thar and Párkar	12,729	16·46	1,904	1,500	3,404	126·93	17·74	16·49	17·03	14·05	12·17	13·05
23	Shikárpur	10,061	83·29	9,329	6,479	17,808	139·39	30·21	21·12	26·07	16·23	8·98	9·67
24	Upper Sind Frontier	1,977	98·16	751	499	1,250	140·49	10·42	9·24	9·90	9·35	7·26	7·78
	Total for the Presidency	122,960	133·85	183,858	161,568	345,426	113·78	21·40	19·31	20·27	29·09	27·40	28·07

N.B.—Those born dead are not included in this or any of the other statements.

Annual Form No. III.—DEATHS *registered in the* Districts *of the* Bombay Presidency *during each month of the year* 1882.

1	2	3												4	5
No.	Districts.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total Deaths registered during the year.	No.
	Northern Deccan Division.														
1	Khándesh	2,178	2,231	2,176	1,875	2,045	1,695	2,154	2,073	2,068	2,112	2,780	2,135	27,304	1
2	Násik	1,540	1,473	1,473	1,402	1,242	1,220	1,377	1,209	1,264	1,396	1,654	1,668	16,919	2
3	Ahmednagar	1,021	820	1,013	1,005	1,201	1,128	1,062	1,082	1,473	1,366	1,713	1,669	14,626	3
4	Poona	1,136	1,111	1,162	1,256	1,451	1,264	1,272	1,370	1,410	1,376	1,478	1,612	16,071	4
5	Sholápur	719	662	623	804	916	783	1,305	1,313	1,098	993	986	997	23,062	5
	Southern Deccan Division.														
6	Belgáum	1,572	1,589	1,768	2,076	2,604	1,997	2,479	2,605	2,403	2,106	1,801	1,604	24,025	6
7	Belgaum	1,326	1,402	1,486	1,665	2,062	1,760	1,894	1,894	1,736	1,442	1,473	1,524	20,253	7
8	Dhárwar	1,764	1,779	1,761	1,622	1,649	1,564	1,691	1,693	1,533	1,653	1,702	1,702	19,595	8
9	Kolábá	804	731	859	932	1,107	1,123	1,180	1,436	1,111	1,057	954	970	12,125	9
	Konkan Division.														
10	Kánara	1,078	1,067	1,029	926	840	826	872	982	787	788	902	905	10,908	10
11	Ratnágiri	1,560	1,114	1,346	1,005	1,104	963	1,206	1,284	1,136	1,139	1,184	1,043	14,437	11
12	Colába	803	764	721	541	505	461	581	586	558	463	502	472	6,957	12
13	Bombay City	2,035	1,919	2,151	1,959	1,654	1,389	1,456	1,395	1,653	1,651	1,697	1,474	20,239	13
14	Thána	2,288	2,072	2,147	1,883	1,801	1,322	1,681	1,611	1,552	1,506	1,736	2,084	20,071	14
	Gujarát Division.														
15	Surat	1,392	1,307	1,274	1,011	1,051	924	1,094	1,139	1,056	1,106	1,504	1,270	14,567	15
16	Broach	730	609	631	592	599	604	659	680	677	569	620	626	7,594	16
17	Kaira	1,597	1,469	1,661	1,305	1,294	1,147	1,291	1,302	1,554	1,702	1,707	1,413	17,576	17
18	Panch Mahals	901	754	754	805	807	691	931	780	833	803	893	822	9,974	18
19	Ahmedabad	2,249	1,943	1,955	1,667	1,720	1,795	1,804	1,340	1,571	1,506	1,749	1,831	20,784	19
	Sind Division.														
20	Karáchi	1,077	899	1,104	841	576	534	487	403	548	577	638	823	8,007	20
21	Hyderabad	1,324	1,187	1,700	1,119	759	561	413	461	567	838	903	1,179	11,000	21
22	Thar and Párkar	473	434	602	454	307	251	185	197	159	141	163	324	3,410	22
23	Shikárpur	796	652	851	826	631	756	934	882	1,379	3,564	4,034	2,672	17,997	23
24	Upper Sind Frontier	61	59	85	79	66	57	53	63	105	259	177	146	1,230	24
	Total for the Presidency	39,719	37,466	39,943	36,806	37,214	34,000	36,689	36,961	38,854	39,032	42,677	39,469	457,831	
	Ratio of Deaths per 1,000 in each month.	1·81	1·67	1·78	1·61	1·72	1·48	1·63	1·62	1·73	1·81	1·90	1·45	20·47	

Annual Form No. IV.—DEATHS *registered according to Age in the* Districts *of the* Bombay Presidency *during the year* 1882.

1	2	3		4		5		6		7		8		9		10		11		12		13
No.	Districts.	Under 1 Year.		1 Year and under 5.		5 and under 10.		10 and under 15.		15 and under 20		20 and under 30.		30 and under 40.		40 and under 50.		50 and under 60.		60 and upwards		No.
		Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	
	Northern Deccan Division.																					
1	Khándesh	2,005	2,513	3,404	3,184	668	607	392	362	244	280	927	1,007	1,007	961	2,187	799	1,320	840	1,516	1,660	1
2	Násik	2,471	1,908	2,207	2,304	641	566	266	268	209	253	663	825	926	752	765	577	727	674	970	1,064	2
3	Ahmednagar	2,179	1,826	1,902	1,856	391	345	247	217	229	209	575	625	556	549	393	287	661	609	930	781	3
4	Poona	1,724	1,296	1,571	1,420	402	366	321	320	325	332	794	826	748	693	577	505	772	670	1,020	1,010	4
5	Sholápur	1,365	1,230	959	892	252	216	245	185	201	156	461	546	505	472	423	419	501	466	542	581	5
	Southern Deccan Division.																					
6	Belgáum	3,044	2,127	3,270	2,725	914	803	483	370	397	417	901	1,119	1,079	998	1,001	823	1,166	986	1,677	1,793	6
7	Belgaum	2,210	1,834	1,570	1,640	720	625	448	346	324	291	719	1,087	1,126	923	1,003	650	913	730	1,399	1,396	7
8	Dhárwar	2,171	2,041	2,324	1,950	514	461	306	248	230	217	579	1,079	998	923	774	708	772	677	977	1,017	8
9	Kolábá	1,458	1,309	713	701	450	384	215	215	219	231	635	787	736	595	567	477	547	535	805	881	9
	Konkan Division.																					
10	Kánara	1,284	1,094	804	804	171	203	161	154	183	206	620	920	874	900	739	577	807	443	1,558	1,882	10
11	Ratnágiri	1,696	1,178	998	696	366	277	178	169	207	177	577	1,011	1,004	776	1,011	776	1,143	1,013	1,413	1,416	11
12	Colába	903	804	617	573	208	189	135	103	141	149	323	522	496	316	412	305	379	327	627	676	12
13	Bombay City	2,056	2,004	1,384	1,327	325	342	259	241	455	484	1,419	1,514	1,526	1,271	1,253	1,057	1,772	1,406	2,307	2,322	13
14	Thána	1,806	1,686	1,514	1,362	639	621	349	350	397	377	1,078	1,393	1,304	976	1,243	787	1,046	841	1,295	1,314	14
	Gujarát Division.																					
15	Surat	1,078	1,293	1,402	1,309	607	576	398	339	393	392	834	940	893	826	667	600	678	508	949	894	15
16	Broach	627	456	402	422	132	134	109	87	108	108	322	393	416	399	405	366	446	332	1,050	1,015	16
17	Kaira	1,606	1,345	1,290	1,310	437	393	257	253	307	281	1,021	1,066	1,115	1,174	1,115	1,011	1,441	913	4,386	4,192	17
18	Panch Mahals	432	374	397	332	146	156	99	93	84	102	212	305	246	196	235	231	289	149	174	177	18
19	Ahmedabad	2,026	1,747	1,333	1,369	567	497	313	429	400	413	1,347	1,182	1,456	1,341	1,259	893	1,124	889	2,201	2,273	19
	Sind Division.																					
20	Karáchi	1,027	870	434	401	222	226	156	139	173	159	364	417	374	405	407	322	459	378	660	561	20
21	Hyderabad	2,020	1,780	1,057	1,015	393	329	197	125	202	201	647	1,021	1,054	1,033	1,024	1,033	1,193	1,005	1,742	1,551	21
22	Thar and Párkar	787	511	390	359	115	94	56	47	62	70	178	256	242	242	227	242	257	241	319	324	22
23	Shikárpur	2,808	2,227	2,045	1,916	423	349	206	125	217	204	552	787	748	681	726	426	832	456	1,009	917	23
24	Upper Sind Frontier	1,036	1,036	1,036	40	20	20	10	10	10	10	30	30	30	30	30	30	31	30	30	40	24
	Total for the Presidency	41,278	34,703	36,407	31,989	9,624	8,859	6,157	5,304	5,796	6,186	18,603	23,227	23,035	20,373	20,777	16,060	23,014	18,243	33,207	33,513	
	Ratios per 1,000 living	174·90	152·14	34·91	32·07	7·72	7·59	4·95	6·99	8·93	10·64	11·05	12·91	14·15	13·16	22·13	19·20	34·91	30·34	56·61	46·40	

Annual Form No. V.—DEATHS *registered according to* Classes *in the* Districts *of the* Bombay Presidency *during the year* 1882.

No.	Districts.	Population according to Census of 1881. Mahomedans.	Hindus.	Christians.	Other Classes.	Total.	Number of Deaths registered. Mahomedans.	Hindus.	Christians.	Other Classes.	Total.	Ratio of Deaths per 1,000 of Population. Mahomedans.	Hindus.	Christians.	Other Classes.	Total.
	Northern Deccan Division.															
1	Khándesh	93,997	1,143,381	1,146	247	1,237,231	1,871	25,253	4	197	27,324	20·27	22·06	3·49	..	22·07
2	Násik	35,294	742,876	2,644	259	781,209	903	15,126	16	200	16,245	25·58	20·40	6·05	..	20·79
3	Ahmednagar	35,592	709,571	4,821	244	751,228	884	13,214	173	88	14,359	24·83	18·62	35·85	..	19·11
4	Poona	45,036	849,889	9,503	2,183	906,611	830	14,878	99	279	16,071	18·74	17·50	9·47	..	17·72
5	Sholápur	43,907	457,644	619	251	502,467	723	10,160	129	101	11,063	16·47	18·72	208·40	..	19·99
	Southern Deccan Division.															
6	Sátára	58,712	1,004,402	896	120	1,062,330	783	23,301	6	43	24,133	21·30	22·65	6·77	..	22·61
7	Belgaum	90,852	793,377	2,372	153	884,754	1,431	18,478	85	21	20,015	21·03	23·05	13·45	..	22·17
8	Dhárwár	100,622	778,889	2,556	49	882,907	2,091	17,624	47	176	19,938	20·78	22·60	19·05	..	22·39
9	Kolábá	67,080	570,256	625	26	638,403	1,169	10,929	9	18	12,125	17·42	19·15	12·80	..	19·16
	Konkan Division.															
10	Kánara	24,292	383,907	14,859	42	423,346	646	9,830	200	29	10,805	26·54	25·67	20·61	..	25·61
11	Ratnágirí	71,651	992,747	3,273	12	987,969	1,301	15,457	42	37	14,837	15·20	14·58	12·82	..	14·99
12	Kolába	17,891	361,287	305	2,172	381,649	307	6,910	7	32	7,271	19·28	19·13	22·95	13·19	19·07
13	Bombay City	158,094	159,060	42,927	52,776	773,196	4,720	13,732	708	1,069	20,229	29·87	28·49	16·72	20·25	26·16
14	Thána	62,991	922,460	20,545	4,207	909,649	814	18,406	703	96	20,071	12·39	23·45	31·89	20·44	22·06
	Gujarát Division.															
15	Surat	35,347	845,374	622	12,855	414,198	1,277	12,502	6	223	14,007	32·99	29·91	9·65	17·54	29·81
16	Broach	67,248	264,507	115	2,009	328,869	2,239	8,327	1	77	10,644	19·43	30·61	8·69	38·16	30·90
17	Kaira	71,954	730,962	1,045	128	804,089	1,571	16,374	16	9	17,970	21·53	22·41	15·21	69·23	22·23
18	Panch Mahals	16,062	200,310	44	37	225,429	372	3,793	2	5	4,172	23·16	18·47	..	..	18·50
19	Ahmedabad	85,428	760,908	1,849	885	858,324	2,221	18,466	19	78	20,724	26·46	23·97	12·43	31·64	24·39
	Sind Division.															
20	Karáchí	208,117	79,852	4,674	1,675	478,698	6,744	1,969	22	73	8,807	17·16	24·65	4·71	67·91	18·40
21	Hyderabad	621,045	152,189	429	52	754,638	7,951	2,560	2	48	11,060	12·79	22·09	4·67	..	14·65
22	Thar and Párkar ..	157,454	45,092	14	4	202,564	1,811	1,135	..	103	3,049	11·49	32·37	..	..	17·79
23	Shikárpur	690,167	165,010	726	79	855,982	13,235	4,541	2	24	17,802	19·17	27·51	2·75	..	20·79
24	Upper Sind Frontier ..	130,261	13,516	236	12	134,125	926	291	2	11	1,230	8·29	21·46	8·50	..	9·16
	Total for the Presidency ..	3,166,462	13,128,752	136,376	80,877	16,454,416	55,540	382,171	2,330	3,168	443,418	17·93	21·45	16·09	39·17	26·67

N.B.—This and all the other statements refer to Natives only and not to Europeans. It should be stated in a foot-note what castes are included under the class "Hindus" and "Other Classes."

Annual Form No. VI.—DEATHS *registered from* Different Causes *in the* Districts *and* Towns *of the* Bombay Presidency *during the year* 1882.

No.	Districts and Towns.	Population according to Census of 1881.	Cholera.	Small-pox.	Fevers.	Bowel-complaints.	Injuries. Suicide. Males.	Suicide. Females.	Wounding or accident.	Snake-bite and wild beasts.	Total.	All other causes.	Total Deaths from all Causes.	Ratio of Deaths per 1,000 of Population. Cholera.	Small-pox.	Fevers.	Bowel-complaints.	Injuries.	All other Causes.	From age causes. Under one year.	Under five years.	Above five years.	No.
	A.—DISTRICTS.																						
	Northern Deccan Division.																						
1	Khándesh	1,237,231	127	124	21,121	4,147	14	9	217	28	268	695	26,447	0·71	0·10	17·06	3·35	0·22	0·64	22·36	24·82	1
2	Násik	781,209	202	39	14,150	1,497	2	2	109	13	126	1,414	17,503	0·26	0·05	18·11	1·92	0·16	0·18	24·26	27·39	2
3	Ahmednagar	751,228	181	6	9,974	1,304	6	8	125	29	154	1,502	13,291	0·24	0·01	13·28	1·73	0·20	2·24	16·73	20·01	3
4	Poona	906,611	1,256	226	10,258	1,086	3	3	163	11	180	1,674	15,101	1·38	0·24	11·31	1·19	0·19	1·83	17·46	17·46	4
5	Sholápur	502,467	750	4	6,232	642	9	7	90	8	114	982	8,790	0·01	0·01	12·76	1·31	0·22	2·32	16·94	19·76	5
	Southern Deccan Division.																						
6	Sátára	1,062,330	2,329	3	15,806	1,649	11	17	256	49	334	2,015	21,831	2·24	..	15·04	1·67	0·32	2·06	22·04	23·05	6
7	Belgaum	909,754	1,135	46	9,831	2,253	20	45	199	39	308	4,566	18,839	1·49	0·06	11·77	2·63	0·56	5·64	23·20	29·35	7
8	Dhárwár	781,438	139	10	10,533	3,031	23	40	163	23	254	5,048	17,661	0·16	0·01	12·33	3·52	0·32	4·66	22·21	40·38	8
9	Kolábá	631,469	541	7	8,068	973	24	26	147	34	233	2,240	12,057	0·56	0·01	13·78	1·54	0·30	3·55	19·06	20·23	9
	Konkan Division.																						
10	Kánara	392,670	..	69	6,024	718	18	23	165	27	233	3,564	10,370	..	0·12	10·16	1·22	0·40	6·01	26·60	28·69	10
11	Ratnágirí	973,557	67	2	8,156	737	4	16	205	120	345	4,703	14,130	0·03	0·01	8·36	0·75	0·20	3·02	14·37	14·46	11
12	Kolába	368,469	145	69	3,318	304	3	3	94	34	136	1,316	7,007	0·39	0·18	14·43	0·82	0·37	3·57	19·02	19·02	12
13	Thána	870,831	759	214	15,599	879	17	25	227	153	419	1,316	19,666	0·87	0·24	18·05	0·91	0·48	2·09	22·76	24·66	13
	Gujarát Division.																						
14	Surat	691,125	4	10	8,304	1,579	7	4	145	50	206	661	11,163	0·01	0·02	12·02	2·28	0·42	1·89	22·75	24·63	14
15	Broach	328,869	1	..	5,211	1,148	1	2	71	12	86	1,004	8,450	..	..	15·84	3·49	0·36	2·73	25·70	25·70	15
16	Kaira	787,188	126	5	13,134	1,603	11	21	193	61	286	947	16,179	0·17	0·01	17·81	2·20	0·39	1·29	21·96	22·96	16
17	Panch Mahals	225,745	..	1	3,448	88	3	2	36	20	70	66	3,624	..	..	17·70	0·45	0·36	0·35	18·86	17·26	17
18	Ahmedabad	683,434	487	69	11,930	872	9	17	107	63	192	675	14,157	0·71	0·10	17·36	1·27	0·28	0·98	20·61	21·69	18
	Sind Division.																						
19	Karáchí	469,256	..	37	5,974	194	..	5	124	96	225	644	7,064	..	0·14	14·06	0·37	0·57	1·57	17·71	19·87	19
20	Hyderabad	799,429	2	29	6,345	69	2	2	203	194	401	360	9,027	0·00	0·04	12·46	0·09	0·57	0·61	13·77	13·82	20
21	Thar and Párkar ..	201,518	2	1	2,672	7	1	1	21	10	33	261	3,308	0·02	0·01	14·32	0·03	0·32	1·24	16·74	14·98	21
22	Shikárpur	769,203	..	21	15,624	1,806	1	9	287	77	389	1,117	15,660	..	0·02	19·70	2·34	0·39	1·79	24·25	25·32	22
23	Upper Sind Frontier ..	112,839	..	..	974	51	3	..	21	11	35	1,055	1,064	..	..	8·60	0·39	0·27	0·29	9·55	9·55	23
	Total of Districts ..	14,551,769	8,854	1,196	217,470	24,359	204	317	3,543	1,255	5,669	34,062	288,806	0·49	0·08	15·15	1·62	0·25	2·37	20·16	20·72	

ANNUAL FORM No. VI.—DEATHS *registered from* DIFFERENT CAUSES *in the* DISTRICTS *and* TOWNS *of the* BOMBAY PRESIDENCY *during the year* 1882—continued.

No.	Districts and Towns.	Population according to Census of 1881.	Cholera.	Small-pox.	Fevers.	Bowel-complaints.	Injuries. Suicide. Males.	Suicide. Females.	Injuries. Wounding or accidents.	Injuries. Killed by wild beasts.	Injuries. Total.	All other Causes.	Total Deaths from all Causes.	Ratio of Deaths per 1 000 of Population. Cholera.	Small-pox.	Fevers.	Bowel-complaints.	Injuries.	All other Causes.	From all Causes. For year.	From all Causes. Mean of previous five years.	No.
	B.—TOWNS.																					
	Khándesh District.																					
1	Dhulia	19,449	6	..	268	25	..	..	2	..	2	76	379	0·13	..	9·11	1·25	0·11	4·15	15·15	21·79	1
2	Nandurbár	6,841	..	..	105	14	..	..	..	..	..	1	120	..	..	15·35	2·04	..	0·14	17·53	19·21	2
3	Chopda	13,802	..	7	195	14	1	1	2	..	4	..	224	..	1·02	19·79	2·06	0·44	0·15	23·46	29·21	3
4	Sanderad	10,167	..	..	198	19	..	..	..	..	..	4	221	..	..	19·69	1·88	..	0·40	21·97	37·23	4
	Násik District.																					
5	Násik	23,705	26	2	580	127	2	..	7	1	10	240	973	1·21	0·13	25·56	5·34	0·43	10·10	41·77	51·60	5
6	Yeola	17,085	..	2	344	..	..	..	..	..	..	167	511	..	0·17	19·45	0·81	..	9·78	29·21	34·47	6
7	Deolali Cantonment ..	1,086	..	..	18	1	..	..	..	..	..	3	22	..	..	16·67	0·92	..	2·76	20·35	16·46	7
8	Malegaon	4,748	..	..	59	25	..	..	1	..	1	53	138	..	..	12·61	6·61	0·26	14·02	36·50	40·12	8
	Ahmednagar District.																					
9	Ahmednagar	28,798	..	..	595	87	..	2	3	..	5	331	1,168	..	..	18·06	1·74	0·13	10·13	30·16	49·56	9
10	Sangamner	9,708	..	..	139	4	..	..	3	..	3	66	212	..	..	12·74	0·45	0·24	7·68	21·04	30·26	10
11	Ahmednagar Cantonment	4,694	1	..	33	3	..	2	2	..	4	43	79	0·21	..	5·23	0·64	0·85	9·20	16·03	23·82	11
	Poona District.																					
12	Poona City	99,622	11	126	809	184	4	2	60	..	66	985	2,171	0·11	1·26	8·12	1·85	0·66	9·89	21·79	29·80	12
13	Junnar	10,623	..	..	93	18	..	..	..	1	1	60	172	..	..	8·75	1·70	0·09	5·65	16·19	14·58	13
14	Poona Cantonment ..	30,129	3	24	249	74	2	..	11	..	13	177	540	0·10	0·80	7·26	2·46	0·43	5·87	17·92	21·83	14
15	Kirkee do.	7,252	..	..	43	9	..	..	2	..	2	34	88	..	..	5·93	0·69	0·27	4·69	12·58	..	15
	Sholápur District.																					
16	Sholápur	59,633	87	..	1,046	72	1	2	13	..	16	771	2,420	1·46	..	17·54	1·21	0·27	8·64	29·02	71·73	16
17	Bársi	16,136	37	..	314	23	1	..	4	..	5	350	727	2·29	..	19·46	1·42	0·31	10·83	45·07	72·77	17
18	Pandharpur	16,910	37	..	390	179	2	1	8	3	14	193	743	2·37	..	20·70	10·60	0·83	8·99	43·54	72·35	18
	Sátára District.																					
19	Sátára	39,928	9	1	344	94	2	1	11	1	15	173	535	0·21	0·03	11·83	2·34	0·52	5·93	21·04	32·38	19
20	Karád	16,779	19	..	187	15	..	2	3	1	6	111	338	1·13	..	10·77	0·89	0·06	6·62	19·47	27·59	20
21	Wái	11,676	10	..	108	16	..	..	3	..	3	49	186	0·85	..	9·25	1·37	0·26	4·19	15·92	29·15	21
	Belgaum District.																					
22	Belgaum	28,115	11	..	167	44	..	1	16	..	17	149	388	0·74	..	7·22	1·90	0·74	6·06	16·66	43·72	22
23	Gokák	10,597	103	1	64	65	..	1	3	..	4	36	273	15·01	0·09	6·21	6·60	0·39	3·54	37·43	44·39	23
24	Athni	11,186	4	..	172	23	1	2	3	1	7	129	334	0·36	..	15·01	2·06	0·63	11·53	29·59	36·67	24
25	Belgaum Cantonment ..	9,682	15	..	56	10	..	..	1	..	1	33	115	1·67	..	6·05	1·67	0·10	3·64	13·13	45·42	25
	Dhárwár District.																					
26	Dhárwár	37,191	..	2	814	64	5	3	7	1	16	259	654	..	0·07	11·35	2·35	0·58	9·53	24·05	31·27	26
27	Hubli	36,637	..	1	223	204	1	4	2	..	7	177	412	..	0·03	3·11	7·20	0·19	10·41	20·94	24·98	27
28	Gadag Betigeri	17,901	..	..	115	120	1	..	1	..	2	155	420	..	..	9·60	7·06	0·17	9·12	25·95	35·03	28
29	Kusalsatani	16,332	..	..	106	32	..	2	2	..	4	72	214	..	..	10·29	3·14	0·29	7·05	20·89	29·14	29
	Kolábá District.																					
30	Kolábá	7,034	2	..	89	26	..	..	1	..	1	56	136	0·28	..	8·40	3·41	0·14	7·97	22·20	79·76	30
31	Kolábá Cantonment ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	31
	Kánara District.																					
32	Kárwár	13,561	..	..	122	19	..	..	2	..	2	114	278	..	..	9·00	1·39	0·05	8·37	20·20	25·04	32
33	Kumta	10,859	..	2	113	19	1	1	5	..	7	111	252	..	0·19	10·41	1·79	0·66	10·44	23·71	18·23	33
	Ratnágiri District.																					
34	Vengurla	6,847	..	..	64	7	..	..	2	..	2	149	226	..	..	7·15	0·73	1·01	16·65	25·39	19·95	34
35	Ratnágiri	12,616	12	1	97	65	..	..	3	..	3	77	275	0·95	0·08	7·69	5·15	0·24	6·10	22·04	22·85	35
	Kolába District.																					
36	Alibág	6,376	4	2	62	1	1	..	1	..	1	85	159	0·62	0·31	10·35	0·16	0·16	10·19	21·99	30·21	36
37	Mahád	6,804	..	..	74	3	1	1	3	1	6	49	132	..	..	10·88	0·29	0·88	7·20	19·25	26·97	37
	Thána District.																					
38	Thána	14,456	4	2	178	8	2	..	1	..	3	53	245	0·28	0·14	12·31	0·55	0·21	3·66	16·74	24·26	38
39	Kalyán	15,845	..	12	120	2	1	..	3	1	5	31	177	..	0·75	7·57	0·13	0·06	1·95	13·71	29·07	39
40	Panvel	10,551	11	..	122	3	1	..	2	1	4	45	184	1·06	..	11·79	0·19	0·39	4·35	17·79	24·94	40
41	Bombay City	773,196	190	91	5,421	1,586	23	26	279	5	336	13,605	20,229	0·25	0·12	7·01	2·05	0·43	16·39	26·16	37·96	41
	Surat District.																					
42	Surat	109,844	5	73	1,591	..	3	2	27	2	30	979	2,603	0·05	0·71	14·48	..	0·27	8·91	24·41	30·62	42
43	Bulsár	13,259	..	1	111	13	..	1	6	..	7	29	161	..	0·08	8·38	0·98	0·38	2·19	12·17	11·43	43
	Broach District.																					
44	Broach	37,981	..	..	370	7	1	1	11	1	14	133	400	..	..	10·00	0·19	0·26	2·74	13·20	27·25	44
45	Jambusar	11,479	..	..	124	109	..	1	2	2	7	..	240	..	..	10·80	10·40	0·61	..	21·80	29·14	45
	Kaira District.																					
46	Kaira	12,640	7	..	266	32	..	..	2	..	2	33	401	0·53	..	20·63	2·43	0·16	1·62	25·77	27·66	46
47	Nadiád	29,304	..	..	603	1	1	1	3	2	7	38	645	..	..	12·56	0·04	0·23	0·14	12·79	30·61	47
48	Borsad	12,028	..	..	191	3	1	..	1	..	2	3	196	..	..	15·84	0·16	0·33	0·16	16·49	25·03	48
49	Kápadvanj	14,442	139	..	239	40	..	1	2	1	4	37	548	9·62	..	32·71	2·77	0·28	2·56	37·94	13·05	49

Annual Form No. VI.—DEATHS *registered from* Different Causes *in the* Districts *and* Towns *of the* Bombay Presidency *during the year* 1882—continued.

No.	Districts and Towns.	Population according to Census of 1881.	Cholera.	Small-pox.	Fevers.	Bowel-complaints.	Injuries. Suicide. Male.	Suicide. Female.	Wounding or Assault.	Snake-bite and wild animals killed by.	Injuries. Total.	All other Causes.	Total Deaths from all Causes.	Ratio of Deaths per 1,000 of Population. Cholera.	Small-pox.	Fevers.	Bowel-complaints.	Injuries.	All other Causes.	From all Causes. For year.	From all Causes. Mean of previous five years.	No.
	B.—TOWNS—*continued.*																					
	Panch Mahals District.																					
30	Godhra	12,347	..	..	181	7	..	1	2	..	3	6	170	..	..	12·67	0·53	0·48	0·39	13·74	16·24	30
31	Dohad	12,304	..	..	211	1	..	1	2	..	3	6	241	..	0·24	17·02	0·56	0·56	0·39	19·46	27·06	31
	Ahmedabad District.																					
32	Ahmedabad	122,830	115	..	3,120	86	2	9	14	1	26	1,204	5,551	0·94	..	25·40	0·72	0·22	13·97	41·26	39·55	32
33	Gogha	6,561	..	..	126	53	..	..	3	..	3	..	182	..	..	19·21	8·07	0·45	..	27·74	32·87	33
34	Viramgám	18,266	23	..	608	74	..	..	3	2	5	19	827	1·25	..	33·28	4·05	0·27	1·04	45·05	32·73	34
35	Dholka	17,734	20	..	304	43	..	..	12	1	13	23	423	1·12	..	17·14	2·42	0·73	1·27	23·94	24·66	35
36	Ahmedabad Cantonment	4,401	..	..	32	1	..	..	1	..	1	2	37	..	..	0·81	0·21	0·21	0·45	12·36	49·06	36
	Kaira District.																					
37	Kaira	69,322	..	6	914	113	..	..	20	..	20	672	1,745	..	0·09	13·18	1·63	0·41	9·69	25·01	29·46	37
	Sabarkánta District.																					
38	Hyderabad	45,136	..	70	1,003	16	..	1	6	1	8	127	1,303	..	1·55	22·23	0·35	0·18	2·81	28·85	37·48	38
	Thar and Párkar District.																					
39	Umarkot	2,329	..	..	126	1	..	..	..	..	..	3	142	..	..	49·15	0·35	..	0·71	50·21	39·17	39
	Shikárpur District.																					
40	Shikárpur	46,406	..	2	780	7	..	..	15	1	16	100	919	..	0·05	19·84	0·19	0·28	2·47	21·43	29·99	40
41	Sukkur	37,509	..	2	473	67	1	..	8	..	9	66	623	..	0·06	17·27	1·72	0·24	1·76	20·51	29·31	41
42	Larkána	13,180	..	..	498	..	1	..	9	..	10	68	576	..	..	37·79	..	0·79	4·86	43·44	34·98	42
	Upper Sind Frontier District.																					
43	Jacobabád	11,312	..	..	136	18	..	..	11	..	11	11	177	..	..	11·99	1·67	0·97	0·97	15·59	30·42	43
	Total of Towns ..	2,502,643	1,602	446	25,864	4,137	70	74	627	45	816	22,561	54,536	0·59	0·21	12·28	1·96	0·30	10·21	25·99	30·72	
	Total for the Presidency	16,454,614	7,901	1,920	243,454	28,353	274	411	3,880	1,348	5,913	36,164	343,418	0·48	0·10	14·80	1·72	0·36	2·41	20·07	27·86	

N.B.—Districts A in this statement do not include the population or deaths of Towns B. In all the other statements "Districts" include Towns. Towns should include one or more of the principal towns in each district.

Annual Form No. VII.—DEATHS *registered from* Cholera *in the* Districts *of the* Bombay Presidency *during each month of the year* 1882.

No.	Districts.	Cholera of Registration 1881. No. in each District.	Villages. No. in each District.	No. from which Deaths from Cholera were reported.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total. Male.	Total. Female.	Total. Total.	Ratio of Deaths per 1,000 of Population. Male.	Ratio of Deaths per 1,000 of Population. Female.	Ratio of Deaths per 1,000 of Population. Total.	Mean daily per 1,000 of previous five years.	No.
	Northern Deccan Division.																							
1	Khándesh	36	10	2,000	21	17	..	..	..	..	..	86	12	99	..	..	71	64	135	0·11	0·11	0·11	0·05	1
2	Násik	16	10	1,620	69	..	..	..	..	..	15	96	143	39	4	..	142	159	301	0·06	0·61	0·23	0·24	2
3	Ahmednagar	14	9	1,577	25	4	..	..	..	16	40	60	21	37	5	12	139	91	230	0·08	0·06	0·07	0·04	3
4	Poona	14	10	1,777	53	..	6	16	24	8	15	40	37	5	12	..	139	91	230	0·08	0·06	0·07	0·04	4
5	Sholápur	10	10	700	59	..	..	..	4	19	161	222	54	19	..	..	262	217	479	0·39	0·35	0·37	1·03	5
	Southern Deccan Division.																							
6	Sátára	15	14	1,329	226	11	..	..	404	787	216	323	255	167	90	18	1,291	1,125	2,416	2·41	2·12	2·26	2·46	6
7	Belgaum	11	9	1,677	96	..	..	..	241	805	137	82	39	7	5	10	727	607	1,334	1·67	1·41	1·54	2·04	7
8	Dhárwár	9	9	1,571	52	..	..	..	..	2	..	..	..	74	56	19	74	56	130	0·21	0·16	0·18	0·37	8
9	Kolába	10	9	1,150	60	..	..	..	35	103	119	124	25	87	11	1	252	303	555	0·92	0·82	0·85	2·25	9
	Konkan Division.																							
10	Kánara	13	..	1,105	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2·63	10
11	Ratnágiri	10	..	1,202	25	32	35	7	8	6	..	..	3	..	..	..	65	51	99	0·10	0·10	0·10	0·53	11
12	Kolába	9	9	966	16	54	80	..	..	..	..	..	13	..	..	1	119	72	191	0·25	0·25	0·25	1·03	12
13	Bombay City	1	..	..	..	89	35	17	5	1	..	17	12	8	3	5	110	72	182	0·03	0·03	0·03	1·03	13
14	Thána	14	8	2,000	53	69	136	312	69	..	34	70	36	8	..	..	391	393	784	0·66	0·67	0·66	1·59	14
	Gujarát Division.																							
15	Surat	10	8	778	2	2	..	..	1	..	5	1	..	..	..	..	7	3	9	0·02	0·01	0·01	1·06	15
16	Broach	8	8	801	1	..	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	0·01	0·94	16
17	Kaira	11	8	1,000	..	..	..	..	..	..	..	6	126	92	26	..	151	132	283	0·03	0·01	0·02	0·26	17
18	Panch Mahals	7	7	672	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2·56	18
19	Ahmedabad	13	9	950	64	..	..	..	102	444	55	9	..	17	2	..	467	322	789	0·38	0·26	0·32	0·84	19
	Sind Division.																							
20	Karáchi	15	..	730	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0·05	20
21	Hyderabad	7	..	1,103	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0·03	21
22	Thar and Párkar	3	1	73	3	..	..	..	2	..	..	..	..	..	..	..	3	..	3	0·01	..	0·01	0·11	22
23	Shikárpur	20	..	1,307	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0·05	23
24	Upper Sind Frontier ..	4	..	143	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0·09	24
	Total for the Presidency	320	193	24,451	891	379	387	351	754	1,890	1,179	908	1,156	615	362	186	4,366	3,836	7,994	0·05	0·05	0·05	1·58	

ANNUAL FORM NO. VIII.—DEATHS *registered from* SMALL-POX *in the* DISTRICTS *of the* BOMBAY PRESIDENCY *during each month of the year* 1882.

No.	Districts.	Circles of Registration. No. in each District.	Villages. No. from which Deaths from Small-pox were reported.	No. in each District.	No. from which Deaths from Small-pox were reported.	5 January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	6 Total. Males.	Females.	Total.	7 No. of those Deaths among Children. Under 1 year.	Under 12 years.	8 Total Ratio of Deaths per 1,000 of Population. Males.	Females.	Total.	9 Mean Ratio per 1,000 of previous five years.	No.
	Northern Deccan Division.																										
1	Khándesh	26	10	2,000	29	..	..	1	5	15	11	7	7	6	1	5	25	89	71	181	21	56	0·09	0·12	0·11	1·07	1
2	Nasik	16	5	1,695	6	3	..	..	..	2	..	7	21	5	..	..	..	33	22	55	..	..	0·03	0·06	0·04	0·06	2
3	Ahmednagar	14	4	1,367	3	..	..	..	..	..	..	..	..	..	..	3	2	5	3	8	..	..	0·01	0·01	0·01	0·01	3
4	Poona	13	7	1,177	106	2	1	10	29	20	35	24	7	29	45	72	126	227	203	430	70	190	0·22	0·20	0·21	0·22	4
5	Sholápur	10	2	700	2	..	..	2	..	1	..	..	..	..	..	..	..	4	..	4	..	1	0·01	..	0·01	0·21	5
	Southern Deccan Division.																										
6	Sátára	15	4	1,236	1	..	..	..	1	..	..	1	..	..	..	..	..	2	1	3	..	..	0·01	..	0·01	0·13	6
7	Belgaum	15	8	1,973	5	2	14	2	..	3	1	..	3	2	1	3	6	42	35	77	3	12	0·05	0·06	0·05	0·13	7
8	Dhárwár	15	6	1,271	4	..	..	1	..	..	..	..	..	..	..	..	3	8	7	15	4	6	0·01	0·02	0·01	0·26	8
9	Kolábá	16	3	1,180	2	..	..	..	1	..	..	1	..	..	..	..	..	2	4	6	..	..	0·01	0·01	0·01	0·20	9
	Konkan Division.																										
10	Kánara	13	6	1,102	22	..	..	..	3	5	8	13	8	4	..	1	3	35	19	54	1	8	0·14	0·10	0·12	0·26	10
11	Ratnágirí	10	4	1,206	2	..	..	..	1	..	1	..	..	..	..	..	..	2	1	3	..	..	0·01	..	0·01	0·24	11
12	Kolába	8	1	909	51	15	10	10	10	10	9	10	3	..	..	..	..	45	46	91	14	36	0·05	0·05	0·05	0·22	12
13	Bombay City	1	1	..	1	..	..	2	3	2	2	2	2	18	10	23	28	34	39	73	2	16	0·02	0·02	0·02	0·03	13
14	Thána	14	13	2,091	64	1	2	4	7	19	21	25	23	35	34	51	104	154	174	328	71	170	0·08	0·09	0·08	0·25	14
	Gujarát Division.																										
15	Surat	10	5	778	9	3	1	1	2	7	14	11	4	5	1	4	36	59	50	99	20	44	0·13	0·16	0·15	0·73	15
16	Broach	8	3	603	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0·69	16
17	Kaira	11	1	672	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0·07	..	0·07	0·30	17
18	Panch Mahálz	7	1	1,017	1	..	..	..	..	..	..	1	..	..	..	..	..	1	..	1	..	..	0·01	..	0·01	0·01	18
19	Ahmedabad	12	3	952	5	..	..	2	2	..	..	..	..	..	2	2	7	9	14	23	10	13	0·02	0·03	0·02	0·32	19
	Sind Division.																										
20	Karáchi	14	6	799	19	5	9	13	13	7	6	4	..	1	..	2	2	26	25	51	8	17	0·14	0·13	0·13	0·16	20
21	Hyderábád	16	9	1,305	36	2	3	6	1	4	..	..	1	..	..	..	..	17	19	36	4	11	0·03	0·03	0·03	0·26	21
22	Thar and Párkar	6	1	77	1	..	1	..	..	..	..	..	..	..	..	..	..	1	..	1	..	..	0·01	..	0·01	0·22	22
23	Shikárpur	20	7	1,307	12	6	3	3	0	..	..	..	..	..	..	..	..	12	10	22	6	10	0·04	0·02	0·03	0·25	23
24	Upper Sind Frontier	4	1	142	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0·35	24
	Total for the Presidency	360	95	34,431	457	47	45	66	107	120	146	142	98	81	88	201	479	791	689	1,480	241	562	0·03	0·11	0·10	0·40	

ANNUAL FORM NO. IX.—DEATHS *registered from* FEVERS *in the* DISTRICTS *of the* BOMBAY PRESIDENCY *during each month of the year* 1882.

No.	Districts.	Circles of Registration. No. in each District.	Villages. No. from which Deaths from Fevers were reported.	No. in each District.	No. from which Deaths from Fevers were reported.	5 January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	6 Total. Males.	Females.	Total.	Ratio of Deaths per 1,000 of Population. Males.	Females.	Total.	9 Mean Ratio per 1,000 for previous five years.	No.
	Northern Deccan Division.																								
1	Khándesh	26	26	2,000	2,240	1,800	1,856	1,702	1,472	1,760	1,351	1,626	2,316	2,111	1,716	2,386	1,754	11,513	10,981	21,494	13·27	12·66	12·96	17·04	1
2	Násik	16	16	1,695	1,253	1,316	1,186	1,225	1,190	1,090	920	1,214	1,287	1,297	1,198	1,267	1,305	7,880	7,257	15,137	19·62	18·93	19·29	28·01	2
3	Ahmednagar	14	14	1,367	1,106	745	616	726	624	633	587	654	1,020	1,190	1,090	1,045	1,000	5,350	4,774	10,124	15·70	14·01	14·90	20·83	3
4	Poona	13	13	1,177	1,177	804	828	813	942	1,007	892	889	1,010	941	943	1,077	1,007	5,976	5,466	11,442	10·12	9·23	9·68	16·26	4
5	Sholápur	10	10	700	351	156	490	482	627	760	540	852	879	721	606	654	719	4,191	3,771	7,962	14·29	13·13	13·67	19·39	5
	Southern Deccan Division.																								
6	Sátára	15	15	1,239	1,184	1,216	1,117	1,097	1,277	1,369	1,156	1,486	1,709	1,399	1,536	1,491	1,572	8,316	8,079	16,395	15·02	15·25	15·13	23·39	6
7	Belgaum	15	15	1,973	1,977	1,077	1,054	1,027	1,011	1,006	915	913	963	967	1,734	1,715	1,588	7,736	7,714	15,450	7·97	7·93	7·95	13·27	7
8	Dhárwár	15	15	1,271	1,241	1,077	1,041	1,015	998	915	813	863	907	1,734	1,715	1,588	1,572	7,736	7,714	15,450	12·17	12·12	12·14	19·37	8
9	Kolábá	16	16	1,180	1,097	520	521	524	616	819	705	709	874	709	639	646	819	4,162	3,949	8,111	9·11	8·89	9·00	12·93	9
	Konkan Division.																								
10	Kánara	13	13	1,102	914	631	602	613	665	512	490	527	496	451	446	491	536	3,245	3,024	6,269	14·15	12·71	13·43	20·21	10
11	Ratnágirí	10	10	1,206	1,077	1,007	816	1,004	1,024	1,057	654	725	717	617	676	679	675	4,202	3,961	8,163	9·28	7·56	8·42	13·71	11
12	Kolába	8	8	909	825	420	359	362	406	315	328	427	407	405	334	485	507	2,874	2,565	5,439	13·99	13·09	13·55	17·79	12
13	Bombay City	1	1	..	922	1,015	1,013	874	606	450	341	358	491	485	476	439	416	3,976	3,442	7,418	7·64	7·08	7·36	10·61	13
14	Thána	14	14	2,091	1,946	1,686	1,610	1,102	1,154	1,098	1,077	1,125	1,073	1,057	1,071	1,761	1,865	8,965	8,043	16,998	17·46	16·17	16·81	25·15	14
	Gujarát Division.																								
15	Surat	10	10	778	722	372	324	1,005	737	781	662	823	885	753	889	1,096	1,084	5,527	5,164	10,691	18·04	16·77	17·42	24·89	15
16	Broach	8	8	603	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	5,000	5,000	10,000	14·66	14·66	14·66	20·28	16
17	Kaira	11	11	672	905	1,016	1,007	1,419	1,171	1,141	899	1,014	1,105	1,256	1,332	1,396	1,144	7,977	6,648	14,625	16·68	13·86	15·27	19·57	17
18	Panch Mahálz	7	7	979	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	5,000	5,000	10,000	9·84	9·84	9·84	13·93	18
19	Ahmedabad	12	12	952	732	1,343	1,070	1,848	1,240	1,271	1,042	917	1,006	1,192	1,290	1,441	1,456	6,676	7,261	13,937	16·17	17·57	16·88	23·64	19
	Sind Division.																								
20	Karáchi	14	14	799	799	903	749	941	879	476	377	290	317	390	443	681	697	3,998	3,982	7,980	12·34	12·29	12·32	17·72	20
21	Hyderábád	16	16	1,305	1,357	1,345	1,121	1,818	1,041	705	477	582	562	479	760	955	1,010	5,541	4,813	9,354	12·95	11·23	12·10	19·37	21
22	Thar and Párkar	6	6	77	125	140	201	407	266	202	214	154	146	139	158	203	171	1,774	1,337	3,111	16·74	12·62	14·68	20·52	22
23	Shikárpur	20	20	1,307	1,307	625	591	719	772	736	635	630	580	1,289	2,405	4,242	2,581	6,747	9,025	16,772	19·97	26·79	23·38	32·63	23
24	Upper Sind Frontier	4	4	142	142	76	73	67	46	70	97	240	171	141	653	437	1,150	2,21	2,45	4,66	3·09	3·42	3·25	6·00	24
	Total for the Presidency	360	356	34,431	31,268	30,296	31,269	33,743	31,688	31,537	27,214	29,554	32,664	31,648	35,127	39,581	36,564	213,564	203,696	245,454	13·71	13·06	13·39	20·20	

ANNUAL FORM No. X.—DEATHS *registered from* BOWEL-COMPLAINTS *in the* DISTRICTS *of the* BOMBAY PRESIDENCY *during each month of the year* 1882.

No.	Districts.	Circles of Registration.		Villages.		5												6			7			8	9
		No. in each District.	No. from which Deaths from Bowel-complaints were reported.	No. in each District.	No. from which Deaths from Bowel-complaints were reported.	January.	February.	March.	April.	May	June.	July.	August.	September.	October.	November.	December.	Total.			Ratio of Deaths per 1,000 of Population.			Mean Ratio per 1,000 for previous five years.	No.
																		Male.	Female.	Total.	Male.	Female.	Total.		
	Northern Deccan Division.																								
1	Khándesh	26	26	2,000	949	260	206	260	218	459	227	283	321	436	266	280	270	3,361	1,845	4,206	2·73	2·46	2·60	2·65	1
2	Násik	16	16	1,025	379	147	66	125	101	143	146	161	276	219	135	179	126	1,625	800	1,631	2·29	2·08	2·24	2·23	2
3	Ahmednagar	14	14	1,027	454	98	84	85	79	97	105	163	174	145	143	118	84	734	654	1,388	1·02	1·72	1·35	1·46	3
4	Poona	12	12	1,177	294	90	100	84	73	124	109	116	134	136	118	126	123	763	582	1,345	1·05	1·53	1·27	1·35	4
5	Sholápur	10	10	706	105	43	39	48	58	49	79	109	159	100	99	52	74	408	413	906	1·06	1·46	1·25	1·29	5
	Southern Deccan Division.																								
6	Sátára	13	13	1,329	378	89	72	74	115	113	139	245	209	252	185	113	99	906	858	1,814	1·89	1·62	1·71	1·76	6
7	Belgaum	11	11	1,973	842	301	256	246	243	279	206	329	362	249	271	207	219	1,867	1,545	3,412	4·30	3·61	3·96	3·93	7
8	Dhárwár	18	18	1,871	795	253	204	241	248	279	261	345	290	231	207	204	226	1,801	1,626	3,427	4·19	3·76	3·96	4·03	8
9	Kaládgi	10	10	1,130	322	66	90	50	57	97	69	91	132	141	88	82	76	502	426	1,011	1·74	1·48	1·61	1·72	9
	Konkan Division.																								
10	Kánara	13	13	1,102	261	71	66	62	62	58	63	73	76	62	56	49	58	452	299	751	2·03	1·36	1·78	2·19	10
11	Ratnágiri	10	10	1,292	342	113	115	115	55	60	46	49	66	63	48	45	68	476	376	852	1·91	0·72	0·98	1·71	11
12	Kolába	8	8	969	34	10	9	4	5	1	8	12	12	7	5	8	19	67	49	107	0·93	0·72	0·78	0·93	12
13	Bombay City	1	1	..	..	156	128	154	119	98	90	141	169	149	104	126	145	903	693	1,596	1·94	1·21	1·63	1·83	13
14	Thána	14	14	2,091	99	23	23	22	43	15	20	22	20	17	15	10	19	177	99	276	0·28	0·22	0·26	0·25	14
	Gujarat Division.																								
15	Surat	10	9	778	257	112	111	103	91	103	97	105	107	98	110	133	119	723	559	1,282	2·09	1·61	1·85	2·42	15
16	Broach	6	5	601	94	43	33	36	45	37	38	32	46	37	45	37	49	370	226	596	1·60	1·44	1·52	1·87	16
17	Kaira	11	11	879	277	126	111	108	111	124	117	139	162	102	100	187	157	803	606	1,409	2·18	1·61	2·00	2·09	17
18	Panch Mahals	7	7	672	42	9	4	3	5	10	15	3	11	11	14	1	11	47	53	100	0·45	0·49	0·47	0·50	18
19	Ahmedabad	12	12	893	599	121	84	94	79	81	92	98	78	126	81	79	114	640	496	1,136	1·46	1·14	1·33	1·47	19
	Sind Division.																								
20	Karáchi	14	10	730	64	8	23	24	15	13	31	35	21	21	23	25	15	129	135	267	0·50	0·61	0·56	0·37	20
21	Hyderabad	14	13	1,169	48	3	4	3	13	6	7	5	3	6	13	9	10	55	24	79	0·13	0·07	0·10	0·12	21
22	Thar and Párkar	6	4	73	6	1	1	3	..	..	..	5	..	..	..	..	..	5	3	8	0·04	0·03	0·04	0·14	22
23	Shikárpur	20	16	1,867	69	35	16	15	12	22	14	9	9	16	15	21	25	133	67	200	0·29	0·17	0·23	0·28	23
24	Upper Sind Frontier	4	3	142	10	..	..	..	3	4	1	2	0	1	0	3	..	14	16	30	0·29	0·39	0·34	0·38	24
	Total for the Presidency	286	271	34,431	8,646	3,123	2,653	2,611	1,996	2,302	2,184	2,602	3,149	2,916	2,399	2,398	2,330	15,630	12,723	28,353	1·94	1·66	1·79	1·98	25

A.—VACCINE DEPARTMENT.

Statement No. I, showing Particulars of Vaccination in the Bombay Presidency during the year 1882-83.

Number.	Circles and Districts.	Population of Districts according to Census of 1881.	Average Population per Square Mile.	Average Number of Vaccinators employed throughout the Season.	Total Number of Persons vaccinated.			Average Number of Persons vaccinated by each Vaccinator.	Primary Vaccinations.				Revaccinations.		Percentage of Successful Cases.		Persons successfully vaccinated per 1,000 of Population.	Average Annual Number of Persons successfully vaccinated during previous five years.		Average Annual Number of Deaths from Small-pox during previous five years.	
									Total.	Successful.			Total.	Successful.	Primary.	Revaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000.
										Under 1 year.	Over 1 and under 6 years.	Total of all Ages.									
1	2	3	4	5	6			7	8	9	10	11	12	13	14	15	16	17	18	19	20
	THE NORTHERN DECCAN REGISTRATION DISTRICT.				Males.	Females.	Total.														
	KHANDESH COLLECTORATE—																				
1	Dhulia Town	18,449	1844·90	1	435	390	826	826	826	702	94	818	5	1	99·03	20·00	44·24	695	37·67	2	0·11
2	Nandurbar Town	6,841	626·23	...	...	...	...	*Vide*	Statement	No.	III.	...	...	...	...	...	...	...	...	6	0·88
3	Chopda Town, Local Fund ...	13,932	605·74	1	246	234	480	480	480	335	144	480	...	...	100·	...	34·45	304	21·82	...	...
4	Nagirabad Town do. ...	10,107	594·53	1	P. 336	263	599	602	599	363	158	530	3	3	88·48	100·	52·74	156	15·43	...	...
					R. 3	...	3														
5	In the 22 Rural Circles, Local Fund.	1,187,902	120·23	22	P. 20,616	19,961	0,577	1,849	4,687	20,916	17,967	39,560	111	87	97·49	78·38	33·08	29,242	25·23	397	0·33
					R. 88	23	111														
	Total ...	1,237,231	124·43	25	P. 21,634	20,848	42,482	1,704	42,592	22,317	18,363	41,388	119	91	97·42	76·47	33·53	30,397	24·57	405	0·33
					R. 95	24	119														
	NA'SIK COLLECTORATE—																				
6	Yeola Town	17,685	8842·50	...	...	...	...	*Vide*	Statement	No.	III.	...	...	...	...	...	...	...	...	...	...
7	Nasik do. { Local Fund ...	28,766	11883·	...	P. 78	75	153	154	153	82	61	143	1	...	93·46	··	6·02	44	2·48	23	1·30
	{ Municipal. ...				R. 1	...	1														
					P. 433	421	854		854	423	413	839	13	13	98·24	100·	35·85	715	30·08	1	0·04
8	Deolali Cantonment do. ...	1,086	...	1	R. 10	3	13	1,002													
					P. 47	54	101		101	83	18	101	34	34	100·	100·	124·31	88	81·03	...	...
					R. 3	2	34														
9	Málegaon do. Local Fund...	3,780	3780·	...	P. 83	65	148	149	148	134	13	148	1	1	100·	100·	39·42	103	27·25	...	...
					R. 1	...	1														
10	In the 12 Rural Circles, do. ...	734,889	123·82	12	P. 9,967	9,669	19,636	1,643	19,661	12,431	6,581	19,312	86	53	98·35	61·63	26·35	15,922	21·67	220	0·29
					R. 75	11	86														
	Total ...	781,306	131·52	13	P. 10,608	10,284	20,892	1,618	20,917	13,153	7,080	20,543	135	101	98·33	74·81	26·43	16,872	21·60	244	0·31
					R. 118	17	135														
	AHMEDNAGAR COLLECTORATE—																				
11	Sangamner Town Local Fund.	8,796	549·75	...	P. 256	221	477	479	477	390	82	477	2	2	100·	100·	54·46	171	19·44	...	...
					R. 2	...	2														
12	Ahmednagar Town	32,798	4099·75	1	P. 614	669	1,283	1,550	1,283	770	440	1,261	44	40	98·29	90·91	39·67	1,146	34·81	5	0·15
					R. 34	10	44														
13	Do. Cantonment ...	4,604	1175·50		P. 84	76	160		160	95	52	155	63	38	96·87	60·32	41·12	78	16·62	...	...
					R. 28	35	63														
14	In the 11 Rural { Local Fund } Circles. { Municipal. }	704,940	106·91	12	P. 12,556	12,015	25,171	2,116	23,212	17,031	7,729	24,992	217	135	99·29	62·21	35·64	17,559	24·91	140	0·20
					R. 139	78	217														
					217	191	408	408	408	242	151	405	...	...	99·26	...	0·57				
	Total ...	751,228	112·69	13	P. 13,727	13,772	27,499	2,140	27,540	18,528	8,454	27,290	326	215	99·24	65·95	36·61	18,954	25·23	145	0·19
					R. 203	123	326														

Statement No. I, showing Particulars of Vaccination, &c.—*continued.*

Number.	Circles and Districts.	Population of Districts according to Census of 1881.	Average Population per Square Mile.	Average Number of Vaccinators employed throughout the Season.	Total Number of Persons vaccinated.			Average Number of Persons vaccinated by each Vaccinator.	Primary Vaccinations.				Revaccinations.		Percentage of successful Cases.		Persons successfully vaccinated per 1,000 of Population.	Average Annual Number of Persons successfully vaccinated during previous five years.		Average Annual Number of Deaths from Small-pox during previous five years.	
									Total.	Successful.			Total.	Successful.	Primary.	Revaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000.
										Under 1 year.	Over 1 and under 6 years.	Total of all Ages.									
1	2	3	4	5	6			7	8	9	10	11	12	13	14	15	16	17	18	19	20
	THE NORTHERN DECCAN REGISTRATION DISTRICT—*continued.*				Males.	Females.	Total.														
	Poona Collectorate—																				
15	Junnar Town	10,373	305·09	...	.....	...	...	*Vide* Statement No. III.				...	...	...	...	...	...	...	...	...	...
16	Poona City	99,622	24905·50	2	P. 1,621 R. 676	1,239 218	2,860 894	1,877	2,860	1,433	1,195	2,667	894	282	93·25	30·48	29·60	2,458	24·67	15	0·15
17	Poona and Kirkee Cantonments. { Cantonment. / Municipal.	37,381	9345·25	1	P. 829 R. 182 P. 34 R. 2	642 160 20 6	1,471 342 54 8	1,813 62	1,471 54	948 29	472 21	1,450 51	342 8	238 1	98·57 94·44	69·59 12·50	45·16 1·39	[1,072	28·68	2	0·05
18	In the 8 Rural Circles, Local Fund.	753,245	141·93	14	P. 9,878 R. 62	9,364 9	19,242 71	1,379	19,247	8,432	10,038	18,744	71	65	97·41	91·55	24·97	13,315	17·68	108	0·14
	Total ...	900,621	168·41	17	P. 12,362 R. 922	11,265 393	23,627 1,315	1,467	23,632	10,862	11,726	22,912	1,315	586	96·97	44·56	26·09	16,845	18·79	125	0·14
	Sholapur Collectorate—																				
19	Sholápur Town	59,633	2484·71	1	P. 978 R. 193	875 1	1,853 194	2,047	1,853	1,120	651	1,848	194	167	99·73	86·08	33·79	1,530	36·88	22	0·37
20	Bársi do.	16,126	556·07	1	P. 366 R. 2	334 ...	700 2	702	700	432	239	673	2	2	99·14	100·	41·86	181	61·08	3	0·19
21	Pandharpur Town	16,910	3382·	1	558	329	1,087	1,087	1,087	903	171	1,080	...	...	99·36	...	63·87	1,400	82·79	1	0·06
22	In the 7 Rural Circles. { Local Fund / Municipal. }	489,818	109·74	9	P. 8,492 R. 169 P. 720 R. 15	8,330 58 686 ...	16,822 227 1,406 15	1,894 1,421	16,832 1,406	10,616 1,067	5,730 315	16,486 1,388	227 15	151 15	98·00 98·72	66·52 100·	33·97 2·84	[9,867	20·14	83	0·17
	Total ...	582,487	128·83	12	P. 11,114 R. 379	10,754 59	21,868 438	1,859	21,878	14,138	7,106	21,475	438	335	98·20	76·48	37·44	14,082	24·18	109	0·19
	Native States—																				
23	Dáng Territory	60,270	15·70	...	.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	Akalkot	58,040	116·54	1	P. 847 R. 537	736 16	1,583 553	2,136	1,596	1,146	308	1,516	553	506	95·77	91·50	34·84	1,409	25·31	...	...
25	Mudmimb	13,173	154·75	...	P. 236 R. 1	219 ...	455 1	456	455	292	152	451	1	...	99·12	...	32·75	235	17·06	...	...

	TOTALS BY ESTABLISHMENTS IN NORTHERN DECCAN REGISTRATION DISTRICT.																						
	Cantonment	37,381	9345·25	1	P 829 R 182	642 160	1,471 342	1,813	1,471	948	472	1,450	342	238	98·57	69·39	45·16	1,672	28·68	2	0·05
	Municipal	273,684	3175·40	8	P 6,108 R 996	5,484 276	11,592 1,272	1,608	11,592	7,299	3,760	11,286	1,272	593	97·36	46·02	43·50	10,191	37·32	49	0·18
	Local Fund	3,942,308	121·94	71	P 62,508 R 539	60,797 180	123,305 719	1,747	123,496	70,751	48,503	120,872	719	497	98·03	69·12	30·79	85,368	21·65	977	0·25
	Native State	132,083	29·84	1	P 1,083 R 538	955 16	2,038 554	2,592	2,051	1,438	460	1,967	554	506	90·52	91·34	18·72	2,223	16·78	...	...
	Grand Total ...	4,384,856	119·01	81	P 70,528 R 2,255	67,878 632	138,406 2,887	1,744	138,610	80,436	53,195	135,575	2,887	1,834	97·95	63·53	31·34	98,854	22·54	1,028	0·23
	THE SOUTHERN DECCAN REGISTRATION DISTRICT.																						
	SA'TA'RA COLLECTORATE—																						
26	Sátára Town	29,028	9676	1	P 434 R 55	424 12	858 67	925	858	549	309	858	67	67	100	100	31·87	953	32·63	6	0·21
27	Karád do.	10,778	7185·33	...	.....	...	Fide	Statement	No. III.	...	...	...	...	...	...	...	...	...	...	1	0·09
28	Wái do.	11,676	5838·	...	.....	...	Do.	do.	...	...	...	...	...	...	...	...	...	...	...	9	0·77
29	In the 12 Rural Circles, Local Fund.	1,010,868	202·94	12	P 15,972 R 279	15,218 28	31,190 307	2,423	31,204	17,300	12,810	30,391	307	265	97·44	86·32	30·33	25,746	25·47	109	0·11
	Total ...	1,062,350	212·98	14	P 16,406 R 334	15,642 40	32,048 374	2,316	32,062	17,849	13,119	31,249	374	332	97·51	88·77	29·73	26,699	25·13	125	0·12
	BELGAUM COLLECTORATE—																						
30	Gokák Town	10,307	...	...	.....		Fide	Statement	No. III	...	...	...	...	...	...	...	...	...	...	1	0·10
31	Athni do.	11,186	...	...	.....		Do.	do.	...	...	...	...	...	...	...	...	...	...	...	6	0·54
32	Belgaum Town...	23,115	...	1	P 401 R 43 P 106	453 21 112	854 66 218	1,162	854	344	440	808	66	24	94·61	36·36	35·99	867	37·51	10	0·43
33	Do. Cantonment	9,582	...		R 12	12	24		218	109	91	208	24	14	95·41	58·33	23·17	72	7·51	1	0·10
34	In the 7 Rural Circles, Local Fund.	809,824	173·90	11	P 11,268 R 522	10,881 180	22,149 702	2,077	22,178	9,384	11,647	21,779	702	588	98·33	83·76	27·62	14,966	18·48	170	0·21
	Total ...	864,014	185·54	12	P 11,775 R 979	11,446 213	23,221 792	2,001	23,250	9,837	12,178	22,795	792	626	98·16	79·04	27·11	15,905	18·41	188	0·22
	DHA'RWA'R COLLECTORATE—																						
35	Dhárwár Town	27,191	...	1	P 542 R 31	511 2	1,053 33	1,086	1,054	508	415	974	33	31	92·50	93·94	36·96	1,124	41·34	10	0·37
36	Hubli do.	36,677	...	1	P 678 R 65	717 9	1,395 74	1,469	1,401	813	501	1,340	74	65	96·06	87·88	38·31	911	24·84	9	0·25
37	Gadag Bettigeri Town... ...	17,001	...	1	P 594 R 11	621 ...	1,215 11	1,226	1,215	733	405	1,150	11	11	94·65	100	68·29	772	45·41	4	0·24
38	Kánebennur do. Local Fund.	10,202	...	1	P 509 R 44	463 23	972 67	1,039	983	382	507	954	67	58	98·14	86·56	99·20	348	34·12	5	0·49
39	In the 14 Rural Circles. do..	918,736	174·02	14	P 9,227 R 707	9,030 126	18,357 833	1,385	18,382	7,395	9,688	17,875	833	506	96·32	60·74	20·01	12,458	13·56	296	0·32
	Total ...	882,907	194·70	18	P 11,850 R 858	11,342 100	23,192 1,018	1,345	23,237	9,831	11,516	22,293	1,018	671	96·12	65·91	26·01	15,613	17·68	324	0·36

Statement No. I, showing Particulars of Vaccination, &c.—*continued.*

Number.	Circles and Districts.	Population of Districts according to Census of 1881.	Average Population per Square Mile.	Average Number of Vaccinators employed throughout the Season.	Total Number of Persons vaccinated.			Average Number of Persons vaccinated by each Vaccinator.	Primary Vaccinations.				Revaccinations.		Percentage of Successful Cases.		Persons successfully vaccinated per 1,000 of Population.	Average Annual Number of Persons successfully vaccinated during previous five years.		Average Annual Number of Deaths from Small-pox during previous five years.	
									Total.	Successful.			Total.	Successful.	Primary.	Revaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000.
										Under 1 year.	Over 1 and under 6 years.	Total of all Ages.									
1	2	3	4	5	6			7	8	9	10	11	12	13	14	15	16	17	18	19	20
	THE SOUTHERN DECCAN REGISTRATION DISTRICT—*continued.*				Males.	Females.	Total.														
	KALA'DGI COLLECTORATE—																				
40	Bágalkot Town...	12,850	...	1	P 505 R 14	464 4	969 18	987	970	559	370	942	18	12	97·21	66·67	74·24	616	47·94	...	...
41	Kaládgi do. Local Fund ...	7,024	...	...	23	24	47	47	47	32	15	47	...	...	100·	...	6·69	174	24·77	4	0·57
42	Do. Cantonment do. ...																				
43	In the 8 Rural Circles do. ...	618,619	107·63	8	P 7,317 R 282	7,133 87	14,450 369	1,852	14,456	7,775	5,874	14,101	369	282	97·58	76·42	23·25	10,576	17·10	106	0·17
	Total ...	638,493	110·90	9	P 7,845 R 296	7,621 91	15,466 387	1,761	15,473	8,366	6,259	15,099	387	294	97·37	75·97	24·09	11,366	17·80	110	0·17
44	KOLHA'PUR STATE	809,189	284·16	11	P 10,522 R 173	10,091 36	20,613 209	1,892	20,637	9,771	9,191	19,481	293	159	94·51	78·33	24·54	14,062	17·57	...	...
	SOUTHERN MARA'THA JA'GHI RS—																				
45	Sángli	196,832	219·68	4	P 2,085 R 92	1,915 10	4,000 102	1,025	4,003	1,676	1,927	3,690	102	83	92·25	81·37	19·17	2,433	12·36	...	...
46	Jamkhandi	87,917	170·56	2	P 1,637 R 14	1,661 2	3,298 16	1,657	3,298	1,844	1,309	3,262	16	14	98·91	87·50	39·04	2,028	24·17	...	...
47	Miraj (Senior)	55,959	222·94	2	P 798 R 30	750 8	1,548 38	793	1,560	567	793	1,410	38	26	91·09	68·42	25·06	1,104	19·72	...	...
48	Do. (Junior)	30,541	146·83	1	285	267	552	552	552	293	259	552	...	...	100·	...	18·07	486	15·91	...	...
49	Kurundvád (Elder)	35,187	193·33	1	P 419 R 6	446 1	865 7	872	869	266	551	836	7	7	96·65	100·	23·93	648	18·42	...	...
50	Do. (Younger) ...	25,811	226·41	1	P 361 R 3	336 ...	697 3	700	697	290	342	632	3	2	90·67	66·67	24·36	373	14·45	...	...
51	Mudhol	52,163	144·10	1	P 900 R 16	843 2	1,743 18	1,763	1,745	867	813	1,741	18	18	99·77	100·	33·72	961	18·42	...	...
52	Ránadurg	29,570	211·21	1	P 459 R 27	416 8	875 35	901	867	389	365	833	35	28	96·18	80·00	29·12	523	17·69	...	...
	Total ...	509,980	192·81	13	P 6,933 R 188	6,636 31	13,571 219	1,061	13,591	6,192	6,359	12,956	219	178	95·47	81·28	25·75	8,556	16·78	...	...
	SA'TA'RA JA'GHI RS—																				
53	Pant Pratinidhi	58,916	131·80	1	P 522 R 3	515 2	1,037 5	1,032	1,038	424	518	948	5	2	90·54	40·00	16·12	603	10·23	...	...
54	Pant Sachev	145,876	97·84	2	P 1,174 R 4	1,087 2	2,261 6	1,133	2,261	872	1,299	2,230	6	6	98·63	100·	15·33	2,598	17·81	...	...
55	Phaltan	58,402	147·11	1	P 786 R 4	736 ...	1,522 4	1,526	1,523	620	846	1,495	4	3	98·23	75·00	25·65	836	14·31	...	...
56	Jath	55,493	56·68	1	P 1,007 R 18	970 ...	1,977 18	1,995	1,981	1,030	728	1,782	18	15	99·14	83·33	32·38	828	14·92	...	...
	Total ...	318,687	99·16	5	P 3,499 R 29	3,308 4	6,807 53	1,368	6,823	2,946	3,391	6,455	33	26	94·82	78·79	20·34	4,865	15·27	...	...

57	UNDER THE DHARWAR AGENCY— Savanúr State	14,763	210·90	1	P. 438 R. 16	430 10	868 26	894	868	295	528	849	26	19	97·81	73·08	59·80	549	37·18	...	...
	TOTALS BY ESTABLISHMENTS IN SOUTHERN DECCAN REGISTRATION DISTRICT.																						
	Municipal	155,444	5181·466	6	P. 3,299 R. 233	3,302 60	6,562 293	1,142	6,570	3,615	2,531	6,280	293	224	95·70	76·45	41·84	6,101	39·25	40	0·26
	Local Fund	3,292,320	165·17	47	P. 44,616 R. 1,834	42,749 444	87,365 2,278	1,907	87,452	42,268	40,541	85,147	2,278	1,699	97·46	74·38	23·37	63,482	19·28	707	0·21
	Native State	1,643,619	185·85	30	P. 21,394 R. 406	20,465 73	41,859 481	1,411	41,919	19,204	19,469	39,741	481	382	94·94	79·42	24·40	28,032	17·06	...	...
	Grand Total ...	5,091,382	176·90	83	P. 69,220 R. 2,473	66,516 579	135,786 3,052	1,673	135,941	65,087	62,541	131,168	3,052	2,305	96·00	75·52	26·22	97,615	19·17	747	0·15
	THE KONKAN REGISTRATION DISTRICT.																						
	KÁNARA COLLECTORATE—																						
58	Kárwár Town, Local Fund ...	13,761	...	...		*Vide*	Statement	No. III.	...	...	...	...	...	...	...	...	...	101	7·34	...	...
59	Kumta do. do. ...	10,629	...	1	P. 297 R. 2	156 ...	363 3	366	363	83	205	316	3	...	87·05	...	29·73	...	...	1	0·09
60	In the 11 Rural Circles, Local Fund.	397,450	161·63	11	P. 5,740 R. 342	5,143 211	10,883 553	1,040	10,948	1,804	6,073	9,004	553	325	91·00	58·77	25·74	9,489	23·87	95	0·24
	Total ...	421,840	107·87	12	P. 5,947 R. 345	5,299 211	11,246 556	983	11,311	1,887	6,278	10,220	556	325	90·88	58·45	25·00	9,590	22·73	96	0·23
	RATNÁGIRI COLLECTORATE—																						
61	Vengúrla Town, Local Fund ...	8,947	...	...		*Vide*	Statement	No. III.	...	...	...	...	...	...	...	...	...	153	17·10	1	0·11
62	Ratnágiri do. do. ...	12,616	...	...	P. 174 R. 7	186 ...	360 11	371	369	101	216	341	11	4	94·72	36·36	27·35	104	8·24	10	0·79
63	In the 8 Rural Circles, Local Fund.	975,527	248·73	13	P. 11,234 R. 459	11,067 461	22,301 920	1,786	22,369	12,610	8,922	22,143	920	788	99·29	85·65	23·51	24,554	25·17	152	0·16
	Total ...	997,090	254·22	13	P. 11,408 R. 466	11,253 465	22,661 931	1,815	22,738	12,711	9,138	22,484	931	792	99·22	85·06	23·34	24,811	24·88	163	0·16
	KOLÁBA COLLECTORATE—																						
64	Alibág Town, Local Fund ...	6,376	...	...	P. 29 R. 1	28 ...	57 1	58	57	25	23	52	1	1	91·23	100·	8·31	43	6·74	7	1·09
65	Mahád do. do.	6,804	68·04	...		*Vide*	Statement	No. III.	...	...	...	...	...	...	...	...	...	...	...	1	0·15
66	In the 6 Rural Circles, Local Fund.	368,469	246·40	6	P. 4,792 R. 420	4,610 285	9,312 715	1,671	9,323	5,552	3,418	9,126	718	421	98·00	58·83	25·91	8,184	22·21	88	0·24
	Total ...	381,649	253·04	6	P. 4,731 R. 431	4,638 285	9,369 716	1,681	9,380	5,577	3,441	9,178	719	422	97·96	58·93	25·15	8,227	21·56	96	0·25
	THÁNA COLLECTORATE—																						
67	Kalyán Town...	12,910	4303·33	1	P. 419 R. 15	387 5	806 20	1,354	806	392	344	767	20	11	95·16	55·00	60·26	57	4·42	4	0·31
68	Bhiwndi do.	13,837	...		P. 267 R. 13	243 5	510 18		510	251	225	488	18	9	35·92	50·00	35·92	70	5·06	...	...
69	Thána do.	14,456	3614·00	1	P. 520 R. 985	297 155	817 1,120	1,937	817	370	217	809	1,120	444	99·02	39·64	86·68	1,131	78·24	...	...
70	Panvel do.	10,351	1725·17	1	P. 400 R. 3	394 ...	794 3	1,091	794	608	173	794	5	3	100·	60·00	77·00	642	62·02	...	...
71	Uran do.	10,149	...		P. 150 R. 1	141 ...	291 1		291	221	45	267	1	1	91·75	100·	26·41	435	42·86	...	...
72	In the 11 Rural Circles, Local Fund.	846,845	200·21	13	P. 10,469 R. 73	10,311 44	20,780 117	1,607	20,844	9,232	10,741	20,405	117	73	98·20	62·39	24·18	17,216	20·33	191	0·23
	Total ...	908,548	214·14	16	P. 12,225 R. 1,072	11,773 209	23,998 1,281	1,580	24,062	11,074	11,745	23,330	1,281	541	98·05	42·23	29·49	19,551	21·32	195	0·21

Statement No. I, showing Particulars of Vaccination, &c.—*continued.*

Number.	Circles and Districts.	Population of Districts according to Census of 1881.	Average Population per Square Mile.	Average Number of Vaccinators employed throughout the Season.	Total Number of Persons vaccinated.			Average Number of Persons vaccinated by each Vaccinator.	Primary Vaccinations.				Revaccinations.		Percentage of Successful Cases.		Persons successfully vaccinated per 1,000 of Population.	Average Annual Number of Persons successfully vaccinated during previous five years.		Average Annual Number of Deaths from Small-pox during previous five years.	
									Total.	Successful.			Total.	Successful.	Primary.	Revaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000.
										Under 1 year.	Over 1 and under 6 years.	Total of all ages.									
1	2	3	4	5	6			7	8	9	10	11	12	13	14	15	16	17	18	19	20
	THE KONKAN REGISTRATION DISTRICT—*continued.*				Males.	Females.	Total.														
	Native States—																				
73	Sávantvádi	174,433	192·33	1	P. 2,583 R. 717	2,573 400	5,156 1,117	6,273	5,202	3,607	1,286	5,116	1,117	738	99·22	66·07	33·56	4,535	26·00	...	...
74	Janjira	76,361	234·96	1	P. 1,105 R. 3	1,134 ...	2,239 3	2,242	2,239	1,102	1,035	2,239	3	3	100·	100·	29·36	1,949	23·52	...	...
75	Jawhár	48,556	90·93	1	1,167	1,115	2,282	2,282	2,282	1,275	909	2,282	...	...	100·	...	47·00	1,505	30·99	...	...
	TOTALS BY ESTABLISHMENTS IN KONKAN REGISTRATION DISTRICT.																				
	Municipal	61,703	4740·38	3	P. 1,756 R. 999	1,462 165	3,218 1,164	1,461	3,218	1,842	1,004	3,125	1,164	468	97·11	40·21	58·23	2,319	37·58	1	0·02
	Local Fund	2,647,424	195·23	44	P. 32,353 R. 1,315	31,201 1,005	64,036 2,320	1,509	64,273	29,407	29,598	62,287	2,323	1,612	97·24	69·48	24·14	59,860	22·61	549	0·21
	Native State	299,350	169·60	3	P. 4,855 R. 720	4,822 400	9,677 1,120	3,599	9,723	6,044	3,230	9,637	1,120	741	99·59	66·16	34·37	7,989	26·69	...	...
	Grand Total ...	3,008,477	196·96	50	P. 39,136 R. 3,034	37,785 1,570	76,951 4,604	1,631	77,214	37,293	33,832	75,049	4,607	2,821	97·53	61·27	25·58	70,168	23·32	550	0·18
	THE PRESIDENCY CIRCLE.																				
76	Bombay City (Municipal) ...	773,196	35145·27	8	P. 11,408 R. 11,497	10,995 2,955	22,403 14,452	4,607	22,793	14,940	4,641	20,735	14,452	12,056	92·55	83·42	42·41	13,468	17·42	326	0·42
	THE EASTERN GUJARÁT REGISTRATION DISTRICT.																				
	Surat Collectorate—																				
77	Surat Town	109,844	36614·66	1	P. 2,385 R. 291	2,023 36	4,408 297	4,645	4,408	2,340	1,579	4,047	237	42	91·81	17·72	37·23	1,738	15·82	33	0·30
78	Bulsár do.	13,229	...	...	...	Vide	Statement	No. III.	...	...	...	...	...	...	...	...	...	...	...	2	0·15
79	In the 8 Rural Circles, Local Fund.	491,125	295·95	8	P. 7,648 R. 110	7,686 52	15,334 162	1,937	15,376	9,374	5,190	14,800	162	106	97·10	65·43	30·33	12,343	25·13	148	0·30
	Total ...	614,198	369·44	9	P. 10,033 R. 401	9,709 88	19,742 489	2,238	19,784	11,714	6,769	18,937	399	148	95·92	37·09	31·07	14,081	22·93	183	0·30

	BROACH COLLECTORATE—																						
80	Broach City	37,281	...	1	P. 725 R. 52	739 14	1,464 66	1,530 Vide Statement	1,467	769 No. III.	482 ...	1,282 ...	66 ...	40 ...	87·57 ...	60·60 ...	35·46 ...	670 ...	17·97 ...	20 4	0·54 0·33
81	Jambusar Town	11,479	...	...	.....	...	...														
82	In the 6 Rural Circles, Local Fund.	278,170	191·43	5	P. 4,681 R. 137	4,455 25	9,136 162	1,860	9,248	6,234	2,458	8,693	162	73	95·81	45·06	31·73	6,308	22·32	132	0·47
	Total ...	326,930	224·99	6	P. 5,406 R. 189	5,194 39	10,600 228	1,805	10,715	7,003	2,940	10,035	228	113	94·67	49·56	31·04	6,978	21·04	156	0·48
	KAIRA COLLECTORATE—																				
83	Nadiád Town	28,304	2830·40	1	P. 532 R. 15	450 ...	982 15	997	984	740	185	925	15	5	94·20	33·33	32·86	924	32·65	3	0·11
84	Kaira do. Local Fund ...	12,640	1580·	...	P. 174 R. 1	165 ...	339 1	340	339	213	96	312	1	...	92·03	...	24·69	254	20·09	1	0·08
85	Borsad do.	12,228	1222·80	...	.....	Vide Do.	Statement do.	No. III. do.	...	...	...	...	...	...	...	...	...	42	3·43	8	0·65
86	Kapadvanj Town	14,442	2063·14	...	.....	...	...		...	...	...	...	...	...	...	...	...	...	...	...	...
87	In the 7 Rural Circles, Local Fund.	737,186	468·47	8	P. 10,464 R. 22	8,784 8	19,248 60	2,413	19,300	13,229	5,507	18,824	60	42	97·79	70·00	25·52	17,331	23·51	226	0·31
	Total ...	804,800	500·31	9	P. 11,170 R. 68	9,399 8	20,569 76	2,294	20,623	14,182	5,788	20,061	76	47	97·53	61·84	24·98	18,551	23·05	238	0·30
	PANCH MAHA'LS—																				
88	Godhra Town	13,342	...	...	.....	Vide	Statement	No. III.	...	...	...	...	...	...	...	...	...	...	...	9	0·67
89	Dohad do. Local Fund ...	12,394	...	...	P. 186 R. 127	147 ...	333 127	460	334	188	126	320	127	80	96·06	62·99	32·27	490	39·34	3	0·24
90	In the 5 Rural Circles, Local Fund.	229,743	142·40	5	P. 3,852 R. 71	3,739 12	7,591 83	1,535	7,598	4,392	2,812	7,416	83	40	97·69	48·19	32·45	6,429	27·98	37	0·16
	Total ...	255,479	158·35	5	P. 4,038 R. 198	3,886 12	7,924 210	1,627	7,932	4,580	2,938	7,736	210	120	97·62	57·14	30·75	6,919	27·08	49	0·19
	AHMEDABAD COLLECTORATE—																				
91	Gogha Town, Local Fund ...	7,063	...	...	P. 146 R. 1	135 ...	281 1	282	281	176	81	258	1	...	91·81	...	36·53	228	32·26	3	0·42
92	Dholka Town	17,716	...	1	P. 272 R. 1	281 1	553 2	555	536	470	25	498	2	2	90·05	100·	28·22	380	32·74	4	0·23
93	Viramgám Town, Local Fund.	18,990	...	...	P. 311 R. 38	252 ...	563 38	601	563	392	147	540	38	25	95·91	65·79	29·75	665	35·02	9	0·47
94	Ahmedabad City	122,820	614·10	2	P. 1,943 R. 156	1,984 81	3,927 237	2,119	3,942	3,281	508	3,804	238	134	96·86	56·54	32·06	3,985	32·45	3	0·02
95	Ahmedabad Cantonment ...	4,801	...		40	35	75		75	66	7	75	...	...	100·	...	15·62	47	9·79	1	0·21
96	In the 7 Rural Circles. { Municipal ... / Local Fund.. }	684,934	179·34	11	63 P. 11,200 R. 778	71 10,602 196	134 21,802 974	2,091	137 21,965	116 16,917	13 4,053	129 21,097	...	...	92·27 96·37	...	0·19 31·37	16,799	24·53	238	0·35
	Total ...	856,324	224·10	14	P. 13,975 R. 974	13,450 278	27,425 1,252	2,048	27,519	21,418	4,834	26,401	1,253	691	96·27	55·19	31·64	22,304	26·05	258	0·30
97	Rewa Kántha States	543,452	113·41	12	P. 8,229 R. 47	7,655 15	15,884 62	1,329	15,939	6,581	7,988	15,529	62	53	97·76	85·48	28·67	12,897	23·73	...	...
98	Mahi Kántha States	517,485	46·84	5	P. 5,676 R. 18	5,127 4	10,803 22	2,165	10,815	5,167	5,308	10,008	22	15	98·19	68·18	20·53	9,790	18·92	...	...
99	Cambay	86,074	245·93	1	P. 906 R. 1	758 2	1,664 3	1,667	1,665	1,061	584	1,650	3	2	99·16	66·66	19·19	1,993	23·15	...	...
100	Dharampor ...	101,289	127·57	1	1,916	1,848	3,764	3,764	3,764	661	2,263	3,576	...	...	95·01	...	25·30	2,010	24·78	...	...
101	Surat Agency { Bánsda ...	34,122	38·06	1	295	549	1,144	1,144	1,144	204	609	1,084	...	...	94·75	...	31·77	1,051	30·80	...	...
102	Sachin Local Fund.	15,721	374·31	...	P. 377 R. 7	386 5	763 12	775	763	431	280	724	12	7	94·89	58·33	46·49	330	24·17	...	...
103	Jámbughoda Local Fund ...	6,440	45·03	...	92	103	195	195	195	103	91	195	...	...	100·	...	30·28	97	15·06	...	...

Statement No. I, showing Particulars of Vaccination, &c.—*continued.*

Number.	Circles and Districts.	Population of Districts according to Census of 1881.	Average Population per Square Mile.	Average Number of Vaccinators employed throughout the Season.	Total Number of Persons vaccinated.			Average Number of Persons vaccinated by each Vaccinator.	Primary Vaccinations.				Revaccinations.		Percentage of Successful Cases.		Persons successfully vaccinated per 1,000 of Population.	Average Annual Number of Persons successfully vaccinated during previous five years.		Average Annual Number of Deaths from Small-pox during previous five years.	
									Total.	Successful.			Total.	Successful.	Primary.	Revaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000
					Males.	Females.	Total.			Under 1 year.	Over 1 and under 6 years.	Total of all Ages.									
1	2	3	4	5	6			7	8	9	10	11	12	13	14	15	16	17	18	19	20
	TOTALS BY ESTABLISHMENTS IN EASTERN GUJARAT REGISTRATION DISTRICT.																				
	Municipal	329,766	21384·40	6	P. 5,960 R. 425	5,583 132	11,543 557	2,017	11,569	7,782	2,799	10,760	558	223	93·22	40·04	34·24	9,130	28·46	72	0·22
	Local Fund	2,559,126	247·77	37	P. 39,131 R. 1,322	36,544 288	75,675 1,610	2,089	75,962	51,649	20,841	73,329	1,620	903	96·89	55·74	29·01	60,081	23·47	811	0·32
	Native State	1,282,422	73·79	20	P. 17,322 R. 66	15,937 21	33,259 87	1,667	33,327	13,864	16,732	32,447	87	70	97·56	80·46	25·36	28,241	22·02	...	...
	Grand Total ...	4,162,314	150·14	63	P. 62,413 R. 1,813	58,064 451	120,477 2,264	1,948	120,858	73,295	40,372	116,536	2,265	1,196	96·73	52·88	28·29	97,452	23·41	883	0·21
	THE WESTERN GUJARAT CIRCLE—KATHIAWAR STATES.																				
104	Jhálvád Prant — Limbdi	43,063	153·89	1	P. 855 R. 4	788	1,643 4	1,647	1,653	768	763	1,510	4	2	91·90	50·00	35·11	1,410	32·74	...	...
105	Jhálvád Prant — Dhrangadra	99,686	87·29	1	P. 1,388 R. 8	1,218 3	2,606 11	2,617	2,608	1,905	565	2,499	11	8	95·89	72·73	25·15	1,930	19·36	...	...
106	Jhálvád Prant — In five other States...	325,917	109·40	5	P. 5,395 R. 226	5,494 98	10,889 324	2,243	10,902	7,534	2,809	10,427	324	222	95·76	68·52	32·67	9,052	27·77	...	...
	Total ...	468,666	106·47	7	P. 7,638 R. 238	7,500 101	15,138 339	2,211	15,163	10,207	4,077	14,436	339	232	95·36	68·46	31·29	12,392	26·44	...	...
107	Hálár Prant — Rájkot	61,809	229·77	1	P. 1,334 R. 34	1,223 1	2,557 35	2,821	2,557	1,856	670	2,540	35	35	99·33	100·	41·06	2,024	32·75	...	...
108	Hálár Prant — Do. Cantonment ..	6,013	2696·41		P. 92 R. 57	78 2	170 59		170	127	42	170	59	59	100·	100·	38·08	163	27·11	...	...
109	Hálár Prant — Gondal	135,604	197·41	2	P. 2,298 R. 33	2,158 26	4,456 59	2,257	4,456	3,233	977	4,249	59	32	95·25	54·23	31·57	3,050	22·49	...	...
110	Hálár Prant — Morvi... ...	89,964	121·57	1	P. 1,447 R. 108	1,275 58	2,722 166	2,888	2,727	1,851	634	2,556	166	77	93·90	46·39	29·27	2,139	23·78	...	...
111	Hálár Prant — Navánagar	316,147	93·16	3	P. 3,956 R. 63	3,652 37	7,608 100	2,569	7,618	2,937	2,963	7,021	100	67	92·28	67·00	22·42	5,620	17·75	...	...
112	Hálár Prant — In three other States.	74,790	207·13	3	P. 3,677 R. 44	3,515 31	7,192 75	2,422	7,201	3,619	2,920	6,596	75	56	91·71	74·66	88·94	5,064	67·71	...	...
	Total ...	684,227	116·93	10	P. 12,804 R. 339	11,901 155	24,705 494	2,520	24,729	14,623	8,206	23,132	494	326	93·63	65·99	34·28	18,060	26·39	...	...

113	Sorath Prant.	Junagad ...	387,499	101·97	4	P. 4,522 R. 84	4,146 58	8,668 142	2,302	8,686	4,198	3,469	7,818	142	73	90·19	51·41	20·26	5,368	13·85	...	...
114		Jetpur ...	92,533	165·27	1	P. 1,013 R. 18	1,004 6	2,019 24	2,043	2,019	1,422	384	1,842	24	29	91·23	83·33	20·12	1,501	16·22	...	...
115		Porbandar ...	71,072	120·42	1	P. 1,026 R. 25	1,021 18	2,047 43	2,090	2,069	1,060	719	1,788	43	40	87·35	93·02	23·72	1,672	23·33	...	...
116		Bántva ...	38,517	189·46	1	P. 1,180 R. 251	1,170 120	2,350 371	2,721	2,350	1,255	982	2,222	371	321	98·81	86·52	68·62	2,173	56·42	...	...
117		In four other States	50,139	196·74	4	P. 4,341 R. 155	4,134 111	8,475 266	2,185	8,489	4,892	2,828	7,874	266	210	92·91	78·95	161·23	5,938	118·43	...	...
		Total ...	639,780	118·81	11	P. 12,084 R. 553	11,475 313	23,559 846	2,219	23,604	12,772	8,313	21,644	846	664	91·87	78·48	34·87	16,632	26·03	...	...
118	Gohelvád Prant.	Bhávnagar ...	420,708	147·10	6	P. 7,008 R. 158	6,973 133	13,981 291	2,379	14,002	8,553	4,334	13,094	291	158	93·66	54·20	31·56	11,425	27·16	...	...
119		Pálitána ...	62,122	...	1	P. 935 R. 49	940 19	1,935 59	1,994	1,935	962	678	1,640	59	28	87·34	47·46	27·66	1,566	25·21	...	...
120		Vala ...	68,296	...	1	P. 1,042 R. ...	1,011 1	2,053 1	2,054	2,053	1,221	407	1,673	1	1	81·49	100·	24·51	1,903	27·86	...	...
		Total ...	551,126	152·37	8	P. 9,045 R. 198	8,924 153	17,969 351	2,290	17,990	10,736	5,419	16,457	351	187	91·59	53·28	30·20	14,894	27·02	...	...
		Káthiáwar States, Total ...	2,343,899	147·09	30	P. 41,071 R. 1,308	39,800 722	81,371 2,030	2,317	81,486	48,338	26,015	73,959	2,030	1,409	92·99	69·41	32·88	61,998	22·45	...	...
	PALANPUR STATES—																					
121		Deesa	49,821	...	1	1,036 258	963 232	2,049 490	2,539	2,049	1,235	792	2,027	...	...	98·93	...	40·69	1,925	38·64	...	...
122		Do. Cantonment ...	8,376	...		2,535	2,264	4,799	2,309	490	263	123	488	...	...	39·59	...	58·26	416	49·67	...	...
123		Palanpur... ...	184,581	58·69	2	328	309	1,057	1,037	4,801	2,646	1,756	4,402	...	...	92·98	...	24·17	4,229	22·91	...	...
124		Radhanpur	98,129	85·33	1	P. 3,858	3,707	7,565	2,639	1,057	356	417	777	...	...	74·92	...	7·92	1,225	12·48	...	...
125		In three other States ...	235,371	63·67	3	R. 228	185	413		7,565	4,473	2,066	7,118	413	365	94·09	88·38	31·77	7,860	29·12	...	...
		Total ...	576,478	72·06	7	P. 8,265 R. 228	7,675 185	15,940 413	2,336	15,942	9,071	5,694	14,872	413	365	93·30	88·38	26·43	14,655	25·42	...	...
	TOTALS BY ESTABLISHMENTS IN WESTERN GUJARAT CIRCLE.																					
		Government	126,019	464·62	2	P. 2,770 R. 91	2,496 3	5,266 94	2,680	5,266	3,583	1,627	5,223	94	94	99·22	100·	42·21	4,528	35·93	...	...
		Native State	2,794,358	103·55	41	P. 47,066 R. 1,445	44,979 904	92,045 2,349	2,302	92,162	53,826	30,082	85,316	2,349	1,680	92·69	71·52	31·13	72,125	25·81	...	...
		Grand Total ...	2,920,377	107·14	43	P. 49,836 R. 1,536	47,475 907	97,311 2,443	2,320	97,428	57,409	31,709	90,541	2,443	1,774	93·04	72·61	31·61	76,653	26·24	...	...
	THE SIND REGISTRATION DISTRICT.																					
	KARÁCHI COLLECTORATE—																					
126		Karáchi Town	68,332	3416·60	2	P. 2,470 R. 1,788	2,274 628	4,744 2,416	3,580	4,788	2,827	1,087	4,727	2,416	2,015	92·64	83·40	98·67	3,509	51·25	155	2·27
127		In the 13 Rural Circles, Local Fund.	410,356	29·11	2	P. 6,093 R. 1,125	5,161 2,777	11,196 3,902	1,678	11,214	7,547	2,792	10,673	3,902	2,497	85·33	63·99	32·09	18,070	44·03	830	2·02
		Total ...	478,688	33·91	41	P. 8,563 R. 2,913	7,435 3,405	15,940 6,318	2,023	16,002	10,374	3,769	15,400	6,318	4,512	96·81	71·41	41·09	21,579	45·08	985	2·06

Statement No. I, showing Particulars of Vaccination, &c.—*continued.*

Number.	Circles and Districts.	Population of Districts according to Census of 1881.	Average Population per Square Mile.	Average Number of Vaccinators employed throughout the Season.	Total Number of Persons vaccinated.			Average Number of Persons vaccinated by each Vaccinator.	Primary Vaccinations.				Revaccinations.		Percentage of Successful Cases.		Persons successfully vaccinated per 1,000 of Population	Average Annual Number of Persons successfully vaccinated during previous five years.		Average Annual Number of Deaths from Small-pox during previous five years.	
									Total.	Successful.			Total.	Successful.	Primary.	Revaccination.		Number.	Ratio per 1,000.	Number.	Ratio per 1,000.
										Under 1 year.	Over 1 and under 6 years.	Total of all ages.									
1	2	3	4	5	6			7	8	9	10	11	12	13	14	15	16	17	18	19	20
	THE SIND REGISTRATION DISTRICT—*continued.*				Males.	Females.	Total.														
	Hyderabad Collectorate—																				
128	Hyderabad Town	45,195	...	1	P. 771 R. 679	675 20	1,446 699	2,145	1,446	793	634	1,441	699	614	99·65	87·84	43·47	1,731	38·30	194	4·29
129	In the 13 Rural Circles, Local Fund.	709,429	78·57	13	P. 10,805 R. 2,585	9,197 1,133	20,002 3,718	1,825	20,074	13,147	5,451	19,066	3,718	2,435	95·32	65·49	30·31	24,308	34·26	999	1·41
	Total ...	754,624	83·57	14	P. 11,576 R. 3,264	9,872 1,153	21,448 4,417	1,847	21,520	13,940	6,085	20,307	4,417	3,049	95·61	69·03	31·22	26,039	34·51	1,193	1·58
	Thar and Parkar—				Statement No. III.																
130	Umarkot Town...	2,828	...	Vide																	
131	In the 7 Rural Circles, Local Fund.	200,516	15·73	7	P. 5,627 R. 1,603	4,732 3,991	10,359 5,594	2,279	10,378	6,576	3,290	10,065	5,594	3,918	97·16	70·04	69·78	12,113	60·41	9	0·04
	Total ...	203,344	15·97	7	P. 5,627 R. 1,603	4,732 3,991	10,359 5,594	2,279	10,378	6,576	3,290	10,065	5,594	3,918	97·16	70·04	69·78	12,113	59·57	9	0·04
	Shikarpur Collectorate—																				
132	Shikarpur Town	42,496	8499·20	1	P. 606 R. 801	563 9	1,169 810	1,979	1,170	1,120	17	1,137	810	433	97·26	53·46	36·94	2,446	57·56	35	0·82
133	Sukkur do.	27,389	9129·66	1	P. 1,154 R. 545	350 484	1,504 1,029	2,533	1,504	1,460	39	1,501	1,029	1,017	99·80	98·83	91·93	2,593	94·67	4	0·15
134	Larkhana do.	13,188	2198·	1	P. 220 R. 12	209 7	429 19	448	429	392	29	391	19	7	91·14	36·84	30·17	221	16·76	2	0·68
135	In the 17 Rural Circles, Local Fund.	769,913	77·09	17	P. 12,601 R. 2,929	11,240 6,991	23,841 9,920	1,986	23,928	19,022	3,146	22,455	9,937	6,706	94·19	67·50	37·88	32,503	42·22	191	0·25
	Total ...	852,986	85·29	20	P. 14,581 R. 4,287	12,362 7,491	26,943 11,778	1,936	27,031	21,964	3,231	25,484	11,795	8,163	94·58	69·20	39·45	37,763	44·27	239	0·28
	Upper Sind Frontier—																				
136	Jacobabad Town and Cantonment.	11,352	...	Vide	Statement No. III.																
137	In the 3 Rural Circles, Local Fund.	112,829	52·74	3	P. 2,159 R. 670	1,864 871	4,023 1,541	1,855	4,099	2,998	699	3,741	1,559	966	92·99	62·69	41·72	86 6,436	7·58 57·04	3 30	0·26 0·27
	Total ...	124,181	58·05	3	P. 2,159 R. 670	1,864 871	4,023 1,541	1,855	4,099	2,998	699	3,741	1,559	966	92·99	62·69	37·90	6,522	52·76	33	0·27
	Native State—																				
138	Khairpur State	129,153	21·14	3	P. 1,548 R. 4	1,302 ...	2,850 4	951	2,850	2,028	549	2,744	4	4	96·28	100·	21·28	2,735	21·18	...	...

	TOTALS BY ESTABLISHMENTS IN SIND REGISTRATION DISTRICT.																					
	Municipal	196,660	5782·25	6	P. 5,221 R. 3,823	4,671 1,148	9,292 4,973		2,377	9,337	6,562	1,786	9,197	4,973	4,086	98·98	82·16	67·56	10,586	53·85	398	2·02
	Local Fund	2,217,223	46·21	49	P. 37,227 R. 8,912	32,194 10,763	69,452 24,675		1,920	69,693	49,290	15,288	66,000	24,710	16,522	95·07	66·96	37·22	93,431	42·14	2,057	0·93
	Native State	129,153	21·14	3	P. 1,548 R. 4	1,302 ...	2,850 4		951	2,850	2,028	549	2,744	4	4	99·28	100·	21·28	2,735	21·18	...	...
	Grand Total ...	2,542,976	46·99	58	P. 43,996 R. 12,741	37,667 16,911	81,563 29,652		1,917	81,880	57,880	17,623	77,941	29,687	20,612	95·56	69·51	38·75	106,752	41·98	2,455	0·97
	THE BARODA CIRCLE.																					
139	Baroda States	2,185,005	254·96	31	P. 33,400 R. 220	30,533 29	63,933 249		2,070	64,071	49,899	11,424	61,741	249	170	96·57	68·27	28·33	53,097	24·30	...	...
	THE CUTCH CIRCLE.																					
140	Cutch States	512,084	78·78	17	P. 10,510 R. 302	10,109 37	20,619 339		1,253	20,773	11,939	7,732	20,479	339	240	99·32	70·80	40·46	14,779	28·86	...	...
	ADEN.																					
141	Aden Municipality...	34,860	2962·07	1	P. 407 R. 4	191 1	598 5		603	598	36	202	419	5	...	70·07	...	12·02	732	21·00	...	...
	TOTAL OF THE BOMBAY PRESIDENCY. BY ESTABLISHMENTS																					
	Government	126,019	464·62	2	P. 2,770 R. 91	2,496 3	5,266 94		2,680	5,266	3,583	1,627	5,225	94	94	99·22	100·	42·21	4,528	35·93	...	...
	Municipal	1,815,653	9835·61	38	P. 34,120 R. 17,979	31,088 4,797	65,208 22,716		2,314	65,677	42,076	16,723	61,802	22,717	17,650	94·78	77·70	43·76	92,530	28·93	886	0·49
	Cantonment	37,381	9345·25	1	P. 829 R. 182	642 160	1,471 342		1,813	1,471	948	472	1,450	342	238	98·57	69·59	45·16	1,072	28·68	2	0·05
	Local Fund	14,638,401	118·09	248	P. 214,037 R. 13,922	203,785 17,690	419,822 31,612		1,820	420,876	2,43,365	154,771	407,635	31,650	21,223	97·10	67·17	29·26	302,220	24·71	5,101	0·35
	Native State	8,978,074	111·42	146	P. 137,178 R. 3,701	129,102 1,482	266,280 5,183		1,859	266,876	1,58,242	89,678	254,072	5,183	3,793	96·42	73·18	28·72	209,222	22·31	...	...
	In British Territory ...	16,503,663	132·95	288	P. 250,867 R. 32,133	235,336 22,384	486,203 54,717		1,878	487,726	2,86,947	171,760	470,626	54,756	39,173	96·80	71·59	30·89	415,925	25·20	5,989	0·36
	In Native State Territory	9,111,865	112·45	147	P. 140,067 R. 3,742	131,777 1,488	271,844 5,230		1,885	272,440	1,61,867	91,511	259,558	5,230	3,835	95·48	73·33	28·91	213,647	23·45	...	...
	GRAND TOTAL ...	25,615,528	124·85	435	P. 390,934 R. 35,875	367,113 24,072	758,047 59,947		1,880	760,166	4,48,214	263,271	730,184	59,986	43,008	96·32	71·74	30·18	629,572	24·58	5,989	0·23

STATEMENT No. II, showing the Cost of the Department

No.	Circles and Districts.	Establishment.																		Havildars and Peons
		Deputy Sanitary Commissioners.	Superintendents of Circles.	Inspectors of Sanitation and Vaccination.			Assistant Superintendents of Vaccination.			Clerks and Karkuns.	Vaccinators.									
											Government.	Municipal.	Cantonment.	Local Fund.				Native State.		
				1st Class.	2nd Class.	3rd Class.	1st Class.	2nd Class.	3rd Class.					1st Class.	2nd Class.	3rd Class.	Candidates.			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
	THE NORTHERN DECCAN REGISTRATION DISTRICT.																			
	Administrative Charges		1	..	1	1	5	..	..	..	2	..	..	1	2	..	..	..	..	12
1	Khándesh Collectorate	..	..	..	..	..	..	..	..	..	..	..	..	1	3	16	..	..	..	24
2	Násik do.	..	..	..	..	..	..	..	..	..	..	..	..	1	5	6	..	..	..	13
3	Ahmednagar do.	..	..	..	..	..	..	..	..	..	..	..	..	1	2	6	..	..	..	13
4	Poona do.	..	..	..	..	..	..	..	..	..	..	..	1	1	3	5	2	..	..	17
5	Sholápur do.	..	..	..	..	..	..	..	..	..	..	..	..	1	3	5	1	1	..	19
	Total ..	1	..	1	1	5	..	..	..	2	..	1	1	5	18	43	3	1	1	91
	THE SOUTHERN DECCAN REGISTRATION DISTRICT.																			
	Administrative Charges		1	..	1	1	2	..	..	..	2	..	..	1	..	1	..	..	..	9
6	Bijápur Collectorate	..	..	..	..	..	..	..	..	..	..	..	..	1	5	7	..	..	6	19
7	Belgaum do.	..	..	..	..	..	..	..	..	..	..	..	..	1	3	7	1	..	..	12
8	Dhárwár do.	..	..	..	..	..	..	..	..	..	..	..	..	1	2	9	1	1	..	19
9	Kaládgi do.	..	..	..	..	..	..	..	..	..	..	..	..	1	2	4	1	..	..	8
10	Kolhápur States	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	11	12
11	Southern Maráthá Jághirs	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	13	14
	Total ..	1	..	1	1	4	..	..	1	2	..	..	6	..	4	16	27	2	30	94
	THE KONKAN REGISTRATION DISTRICT.																			
	Administrative Charges		1	..	1	1	2	..	..	..	2	..	..	..	..	..	..	..	..	4
12	Kánara Collectorate	..	..	..	..	..	..	..	..	..	..	..	..	1	3	8	1	..	..	13
13	Ratnágiri do.	..	..	..	..	..	..	..	..	..	..	..	..	1	6	9	..	1	..	17
14	Kolába do.	..	..	..	..	..	..	..	..	..	..	..	..	1	2	7	..	1	..	11
15	Thána do.	..	..	..	..	..	..	..	..	..	..	..	2	1	6	6	1	1	..	16
	Total ..	1	..	1	1	3	..	..	..	2	..	..	2	..	4	17	28	3	3	60
	THE PRESIDENCY CIRCLE.																			
	Administrative Charges		..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
16	Bombay	..	..	..	..	..	1	..	..	16	..	..	9	..	..	..	..	..	..	9
	Total ..	..	1	..	..	..	1	..	..	16	..	..	9	..	..	..	..	..	..	9
	THE EASTERN GUJARAT REGISTRATION DISTRICT.																			
	Administrative Charges		1	..	..	1	4	..	..	..	2	..	..	..	..	..	..	..	..	9
17	Surat Collectorate	..	..	..	..	..	..	..	..	..	..	..	1	..	3	4	1	2	..	11
18	Broach do.	..	..	..	..	..	..	..	..	..	..	..	1	..	1	3	1	..	..	6
19	Kaira do.	..	..	..	..	..	..	..	..	..	..	..	1	..	3	4	1	1	..	10
20	Panch Mahals	..	..	..	..	..	..	..	..	..	..	..	1	..	3	3	..	..	..	7
21	Ahmedabad Collectorate	..	..	..	..	..	..	..	..	..	..	..	2	..	1	3	1	..	5	14
22	Mahi Kántha Agency	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	6
23	Rewa Kántha Agency	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	12	12
	Total ..	1	..	..	1	4	..	..	..	2	..	..	6	..	11	17	3	3	23	76
	THE WESTERN GUJARAT CIRCLE.																			
	Administrative Charges		1	..	..	..	..	1	1	2	..	..	..	..	..	..	..	..	..	4
24	Kolhápur	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	35	36
25	Pálanpur	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	6	7
	Total ..	..	1	..	..	..	..	1	1	2	2	..	..	..	..	..	..	..	41	49
	THE SIND REGISTRATION DISTRICT.																			
	Administrative Charges	1	1	1	1	4	..	..	..	2	..	..	..	..	..	..	..	..	..	10
26	Karáchi Collectorate	..	..	..	..	..	..	..	..	..	..	2	..	1	4	4	..	..	..	11
27	Hyderabad do.	..	..	..	..	..	..	..	..	..	..	1	..	1	3	6	1	..	..	12
28	Thar and Párkar	..	..	..	..	..	..	..	..	..	..	..	..	1	2	3	1	..	..	7
29	Shikárpur Collectorate	..	..	..	..	..	..	..	..	..	..	3	..	1	6	10	1	..	2	24
30	Upper Sind Frontier	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	1	..	..	4
	Total ..	1	1	1	1	4	..	..	..	2	..	6	..	6	16	25	4	2	2	67
	THE BARODA CIRCLE.																			
31	Baroda State	..	..	1	1	1	..	..	..	..	..	..	..	..	..	..	..	..	31	34
	THE CUTCH CIRCLE.																			
32	Cutch States	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	17	19
	IN THE ADEN MUNICIPALITY.																			
33	Aden	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1
	TOTAL FOR THE BOMBAY PRESIDENCY	5	3	5	6	30	3	1	2	25	2	20	1	24	89	156	16	146		466

DEPARTMENT.

in the Bombay Presidency during the year 1882-83.

Expenditure.				Paid from					Total.	Number of all successful Vaccinations and Revaccinations.	Average Cost of each successful Case.
Pay of Establishment.	Travelling Allowance.	Contingencies.	Total Cost.	Provincial Funds.	Local Funds.	Municipal Funds.	Cantonment Funds.	Native States Funds.			
21	22	23	24	25	26	27	28	29	30	31	32
Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.		Rs. a. p.
17,666 3 3	1,983 3 4	816 2 6	19,965 8 3	19,865 8 3	....	....	....	....	19,865 8 3	....	....
6,622 5 7	....	576 9 6	7,199 14 1	....	6,959 14 1	240 0 0	....	....	7,199 14 1	41,479	0 2 9
3,644 11 9	....	300 8 10	3,945 4 7	....	3,669 3 3	267 1 4	18 0 0	....	3,945 4 7	20,644	0 3 1
5,820 7 6	....	118 4 3	5,938 11 9	....	5,660 12 3	267 10 6	....	....	5,928 6 9	27,403	0 3 4
4,186 11 7	....	286 7 8	4,473 3 3	....	2,415 12 11	660 13 6	396 7 10	....	4,473 3 3	22,468	0 3 1
3,963 14 3	....	877 5 6	4,841 4 11	....	3,959 5 5	979 13 6	....	882 0 0	4,841 4 11	24,292	0 2 10
39,904 11 5	1,983 3 4	3,690 6 3	48,775 9 6	19,865 8 3	20,704 9 7	2,407 9 9	414 7 10	882 0 0	48,775 9 6	257,409	0 3 1
16,893 4 6	2,941 1 0	1,462 4 6	19,838 12 0	19,838 12 0	....	....	....	....	19,838 12 0	....	....
8,901 2 6	....	246 13 5	9,147 15 11	....	8,827 11 6	258 0 0	....	1,062 4 5	9,147 15 11	58,062	0 2 2
3,566 13 8	....	177 2 7	3,743 0 3	....	3,136 5 9	305 12 7	....	....	3,246 0 0	23,421	0 2 5
5,301 0 6	....	238 12 6	5,539 12 6	....	4,402 5 6	704 6 6	....	264 0 0	5,369 12 0	23,852	0 3 9
2,769 15 11	....	104 9 6	2,874 9 5	....	2,739 9 5	108 0 0	....	....	2,851 9 5	15,264	0 2 11
3,116 4 3	....	141 14 9	3,258 3 11	....	....	....	....	2,658 3 11	2,658 3 11	19,640	0 2 0
3,331 10 2	....	175 8 4	3,504 2 6	....	....	....	....	3,504 2 6	3,504 2 6	13,134	0 4 3
53,113 7 6	2,941 1 0	2,524 3 1	48,877 6 9	19,838 12 0	19,105 14 7	1,376 2 9	....	8,488 9 10	48,977 6 9	153,473	0 5 3
12,694 5 10	1,841 10 5	877 5 6	16,313 5 9	16,313 5 9	....	....	....	....	16,313 5 9	....	....
5,840 0 8	....	713 4 3	6,553 4 11	....	2,602 4 3	....	....	....	2,602 4 3	16,545	0 5 6
4,178 13 2	....	175 2 7	4,353 15 9	....	3,879 7 3	....	....	422 10 0	4,302 1 3	39,130	0 2 4
2,965 10 6	....	99 3 6	3,167 14 0	....	1,854 15 8	....	....	302 14 6	2,157 14 2	13,842	0 3 11
4,301 8 9	....	255 0 6	3,556 9 3	....	2,770 9 9	918 6 6	....	227 9 8	3,916 9 11	14,350	0 3 1
29,982 5 0	1,841 10 5	1,513 3 3	33,967 3 2	16,313 5 9	10,107 5 5	918 6 6	....	1,952 2 0	31,407 3 2	77,870	0 6 5
4,298 0 0	300 0 0	18 0 6	4,578 0 6	4,578 0 0	....	....	....	....	4,578 0 0	....	....
8,734 7 1	....	5,449 1 6	14,233 8 7	....	....	14,233 8 7	....	....	14,233 8 7	32,791	0 6 2
13,084 7 1	300 0 0	5,467 1 6	18,811 8 7	4,578 0 0	....	14,233 8 7	....	....	18,811 8 7	32,791	0 9 2
14,745 6 11	2,398 8 4	1,062 8 3	18,206 5 6	18,206 5 6	....	....	....	....	18,206 5 6	....	....
5,190 4 7	....	211 8 11	5,401 13 6	....	2,454 1 6	248 0 0	....	239 12 6	2,941 14 0	24,476	0 2 0
1,796 5 5	....	120 15 8	1,917 1 1	....	1,570 2 11	262 1 0	....	....	1,832 4 11	16,148	0 2 11
2,801 11 6	....	180 5 10	2,982 1 10	....	2,451 8 10	206 12 6	....	324 12 6	3,033 1 10	22,700	0 2 2
1,446 14 3	....	84 1 3	1,534 15 6	....	1,534 15 6	....	....	....	1,534 15 6	8,803	0 3 1
3,807 14 6	....	280 10 8	4,112 8 2	....	3,938 0 2	....	....	4,112 8 2	4,112 8 2	37,092	0 2 5
1,138 6 6	....	77 0 6	1,275 0 0	....	....	....	....	1,275 0 0	1,275 0 0	10,805	0 1 11
2,899 13 0	....	140 11 6	3,079 7 6	....	....	....	....	3,079 7 6	3,079 7 6	13,582	0 3 3
35,865 3 11	2,398 8 4	2,158 15 6	39,992 9 3	18,206 5 6	11,947 15 5	1,825 4 0	....	8,106 0 6	39,992 9 3	117,706	0 4 11
12,410 7 6	1,600 5 0	703 5 3	15,060 1 9	13,200 1 6	....	....	....	600 0 0	13,800 1 6	....	....
11,214 12 6	1,810 9 0	203 14 5	13,498 10 11	252 0 0	....	....	....	13,156 10 3	13,408 10 3	77,678	0 2 9
2,026 14 6	....	54 4 6	2,081 3 0	228 0 0	....	....	126 0 0	1,726 2 6	2,081 2 6	13,527	0 2 3
26,651 4 6	3,410 5 0	1,301 7 10	30,639 14 8	13,777 1 6	....	....	126 0 0	15,482 12 9	29,489 14 4	92,205	0 5 1
12,149 10 1	3,792 7 7	990 4 11	22,641 6 11	21,302 0 5	....	1,279 6 6	....	....	22,641 6 11	....	....
4,901 1 6	704 0 0	291 9 5	4,900 10 5	....	3,240 10 5	660 0 0	....	....	4,000 10 5	19,913	0 3 3
4,671 1 11	704 0 0	243 12 3	5,618 14 6	....	4,967 14 6	325 0 0	....	....	5,292 14 6	75,836	0 1 7
2,053 9 2	480 0 0	224 9 10	2,757 19 0	....	2,497 1 0	....	....	....	2,497 1 0	13,983	0 3 1
5,022 0 3	1,207 14 8	605 15 0	6,745 14 1	....	6,207 5 4	1,112 10 9	....	1,317 0 0	8,736 14 1	26,566	0 5 10
956 7 7	176 0 0	104 14 7	1,196 6 2	....	1,196 6 2	....	....	....	1,196 6 2	4,767	0 4 1
55,967 5 6	8,078 6 3	2,020 8 11	64,511 5 1	21,302 0 5	18,404 3 5	3,426 1 3	....	1,317 0 0	44,511 5 1	98,235	0 7 2
11,447 12 3	113 1 1	377 9 11	11,938 1 2	....	....	....	....	11,938 1 2	11,938 1 2	61,911	0 3 1
3,907 5 0	3,690 9 1	11 5 1	7,705 3 11	....	....	....	....	7,705 3 11	7,705 3 11	20,758	0 5 11
410 0 0	....	....	410 0 0	....	....	410 0 0	....	....	410 0 0	410	0 15 0
1,27,490 11 8	22,219 10 11	16,475 6 10½	2,66,285 12 3½	1,12,908 1 7	77,767 6 5	24,005 15 4½	540 7 10	51,425 14 1	2,66,285 12 3½	772,192	0 5 7

B.—DISPENSARY VACCINATION.

Statement No. III, showing Dispensary Vaccination in the Bombay Presidency during the year 1882-83.

Districts.	Number of Dispensaries in each District to which a Vaccinator is attached.	Average Number of Vaccinators attached to Dispensaries during the Month.	Total Number of Persons vaccinated.			Number of Persons vaccinated by each Vaccinator.	Primary Vaccination.				Revaccination.		Percentages of Successful Cases.	
								Successful.						
			Males.	Females.	Total.		Total.	Under 1 year.	1 and under 6.	Total of all Ages.	Tried.	Successful.	Primary.	Revaccination.
1	2	3	4			5	6	7	8	9	10	11	12	13
Khándesh Collectorate.														
THE NORTHERN DECCAN REGISTRATION DISTRICT.														
Párola	...	...	453	460	913	913	913	728	170	898	...	...	98·36	...
Erandol	...	...	249	240	489	489	492	386	102	488	...	...	99·80	...
Dharangaon	...	...	P. 46	49	95	102	95	39	34	94	7	6	98·95	85·71
			R. 6	1	7									
Nandurbár	...	...	P. 167	135	302	307	302	146	109	255	5	1	84·44	20·00
			R. 3	2	5									
Shahgaon	...	...	107	105	212	212	212	64	120	186	...	...	87·74	...
Shirpur	...	...	163	148	311	311	311	251	50	301	...	...	96·78	...
Total	...	...	P. 1,185	1,137	2,322	369	2,325	1,634	585	2,222	12	7	95·69	58·33
			R. 9	3	12									
Nasik Collectorate.														
Sinnar	...	...	P. 186	190	376	378	377	196	176	375	2	2	99·73	100·
			R. 1	1	2									
Dindori	...	...	57	64	121	121	121	96	17	114	...	...	94·21	...
Yeola	...	...	P. 343	339	682	689	682	334	277	611	7	5	89·59	71·43
			R. 6	1	7									
Málegaon	...	...	P. 162	139	301	302	301	101	179	281	1	...	93·36	...
			R. 1	...	1									
Satana	...	...	105	86	191	191	191	173	17	191	...	...	100·	...
Peint	...	...	44	26	70	70	70	53	16	70	...	...	100·	...
Pimpalgaon B.	...	...	83	71	154	154	154	117	37	154	...	...	100·	...
Total	...	...	P. 980	915	1,895	272	1,896	1,070	719	1,796	10	7	94·78	70·00
			R. 8	2	10									
Ahmednagar Collectorate.														
Shevgaon	...	...	49	35	84	84	84	43	28	71	...	...	84·52	...
Nevása	...	...	79	77	156	156	156	98	46	144	...	...	92·31	...
Total	...	...	128	112	240	120	240	141	74	215	...	...	89·58	...
Poona Collectorate.														
A'landi	...	...	7	10	17	17	17	...	8	8	...	...	47·06	...
Junnar	...	...	131	96	227	227	227	106	99	207	...	...	91·19	...
Indápur	...	...	101	93	194	194	195	86	87	175	...	...	90·21	...
Khed	...	...	P. 45	44	89	92	86	29	24	57	6	6	66·28	100·
			R. 4	2	6									
Talegaon Dhamdhera	...	...	136	133	269	269	269	88	131	219	...	...	81·41	...
Sásvad	...	...	141	142	283	283	283	171	108	281	...	...	99·29	...
Jejuri	...	...	P. 66	50	116	118	116	76	36	112	2	2	96·55	100·
			R. 2	...	2									
Bárámati	...	...	126	111	237	237	239	132	82	216	...	...	90·14	...
Talegaon Dábháda	...	...	55	44	99	99	99	35	53	88	...	...	88·89	...
Total	...	...	P. 805	723	1,528	171	1,531	721	630	1,363	8	8	89·20	100·
			R. 4	4	8									
Sholápur Collectorate.														
Karmála	...	...	113	102	215	215	215	171	34	206	...	...	95·81	...
Akalkot (Native State.)	...	...	P. 164	144	308	468	308	248	40	294	160	143	95·45	89·37
	...	...	R. 152	8	160									
TOTAL FOR THE NORTHERN DECCAN REGISTRATION DISTRICT	...	...	P. 3,375	3,133	6,508	238	6,515	3,985	2,082	6,096	190	165	93·67	86·84
	...	...	R. 173	17	190									
THE SOUTHERN DECCAN REGISTRATION DISTRICT.														
Sátára Collectorate.														
Wái	...	...	P. 109	121	230	235	230	94	113	213	5	3	92·61	60·00
			R. 4	1	5									
Pátan	...	...	62	67	129	129	129	101	12	116	...	...	89·92	...
Karád	...	...	P. 237	200	437	438	437	303	104	416	1	1	95·19	100·
			R. 1	...	1									
Islámpur	...	...	208	148	356	356	356	249	103	352	...	...	98·88	...
Mhasvad	...	...	P. 88	82	170	173	170	119	47	167	3	3	98·24	100·
			R. 3	...	3									
Phaltán	...	...	58	46	104	104	104	99	5	104	...	...	100·	...
Tásgaon	...	...	P. 163	146	309	311	314	179	74	253	2	2	81·88	100·
			R. 1	1	2									
Total	...	...	P. 925	810	1,735	249	1,740	1,144	458	1,621	11	9	93·43	81·82
			R. 9	2	11									

Statement No. III, showing Dispensary Vaccination, &c.—*continued.*

Districts.			Number of Dispensaries in each District to which a Vaccinator is attached.	Average Number of Vaccinations performed in each Dispensary during the season.	Total Number of Persons vaccinated.			Average Number of Persons vaccinated by each Vaccinator.	Primary Vaccination.				Revaccination.		Percentage of Successful Cases.	
										Successful.						
					Males.	Females.	Total.		Total.	Under 1 year.	1 and under 6.	Total of all Ages.	Total.	Successful.	Primary.	Revaccination.
1			2	3	4			5	6	7	8	9	10	11	12	13
	THE SOUTHERN DECCAN REGISTRATION DISTRICT—*continued.*															
Belgaum Collectorate.	Chikodi				106	106	212	212	212	80	117	210	...	...	99·06	...
	Parasgad	P.			90	93	183	186	183	95	75	172	3	2	93·99	66·67
		R.			3	...	3									
	Gokák				172	167	339	341	341	226	97	327	2	1	96·46	50·00
	Athni				235	205	440	440	441	266	154	423	...	...	96·14	...
	Total	P.			603	571	1,174	294	1,177	667	443	1,132	5	3	96·42	60·00
		R.			4	1	5									
District Collectorate.	Háveri	P.			58	45	103	111	104	6	47	63	8	7	61·16	87·50
		R.			5	3	8									
Kaládgi Collectorate.	Bágevádi				46	49	95	95	95	58	29	88	...	...	92·63	...
	Ilkal	P.			164	181	345	346	347	159	171	331	1	1	95·94	100·
		R.			1	...	1									
	Bijápur	P.			55	45	100	110	100	39	55	95	10	10	95·00	100·
		R.			9	1	10									
	Muddebihál				55	37	92	92	93	45	34	84	...	...	91·30	...
	Total	P.			329	312	632	161	635	301	289	598	11	11	94·02	100·
		R.			10	1	11									
Kolhápur State.	Malkápur	P.			48	37	85	87	85	50	27	77	2	...	90·59	...
		R.			2	...	2									
	Kolhápur	P.			523	500	1,023	1,288	1,022	644	316	979	265	233	95·70	87·92
		R.			212	53	265									
	Gad Hinglaj	P.			157	119	276	317	276	126	130	262	41	40	94·93	97·56
		R.			23	18	41									
	Total	P.			728	656	1,384	564	1,384	820	473	1,318	308	273	95·23	88,64
		R.			237	71	308									
Southern Maratha Jaghirs.	Sángli	P.			168	176	344	356	344	142	173	321	12	4	93·31	33·33
		R.			8	4	12									
	Sháhpur	P.			112	93	205	207	205	52	96	148	2	...	72·20	...
		R.			1	1	2									
	Mangalvedha	P.			113	114	227	230	227	154	56	212	3	1	93·39	33·33
		R.			3	1	3									
	Terdál	P.			60	70	130	131	131	25	79	104	1	1	80·00	100·
		R.			1	...	1									
	Shirhatti				48	14	62	62	62	42	11	53	...	...	85·48	...
	Kocchi	P.			62	64	126	144	126	85	24	117	18	4	92·86	22·22
		R.			17	1	18									
	Miraj	P.			119	77	196	213	196	101	93	196	17	16	100·	94·12
		R.			14	3	17									
	Budgaon				15	9	24	24	24	12	12	24	...	...	100·	...
	Mudhol	P.			117	114	231	236	231	103	117	231	5	3	100·	60·00
		R.			5	...	5									
	Rámdurg	P.			63	64	127	130	127	63	44	121	3	2	95·27	66·67
		R.			3	...	3									
	Total	P.			877	795	1,672	173	1,673	779	705	1,527	61	31	91·33	50·82
		R.			51	10	61									
	Native States, Total	P.			1,605	1,451	3,056	263	3,057	1,599	1,178	2,845	369	304	93·10	82·38
		R.			288	81	369									
	TOTAL FOR THE SOUTHERN DECCAN REGISTRATION DISTRICT.	P.	...	...	3,511	3,189	6,700	245	6,713	3,717	2,415	6,259	404	334	93·42	82·67
		R.			316	88	404									

Statement No. III, showing Dispensary Vaccination, &c.—*continued.*

Districts.	Number of Dispensaries in each District to which a Vaccinator is attached.	Average Number of Vaccinators attached to Dispensaries during the Month.	Total Number of Persons vaccinated.			Average Number of Persons vaccinated by each Vaccinator.	Primary Vaccination.				Revaccination.		Percentage of Successful Cases.	
								Successful.						
			Males.	Females.	Total.		Total.	Under 1 year.	1 and under 6.	Total of all Ages.	Total.	Successful.	Primary.	Revaccination.
1.	2	3	4			5	6	7	8	9	10	11	12	13
THE KONKAN REGISTRATION DISTRICT.														
Kánara Collectorate.														
Kárwár	...	...	P. 130	92	222	280	222	60	82	201	58	42	90·54	72·41
			R. 40	18	58									
Honávar	...	...	P. 39	42	81	85	81	15	52	80	4	4	98·76	100·
			R. 2	2	4									
Sirsi	...	...	P. 112	93	205	210	205	56	90	173	5	4	84·39	80·00
			R. 3	2	5									
Siddápur	...	...	16	13	29	29	29	11	16	27	...	...	93·10	...
Yellápur	...	...	P. 23	28	51	56	51	18	23	42	5	4	82·35	80·00
			R. 4	1	5									
Haliyál	...	...	P. 72	71	143	145	143	106	24	138	2	...	96·50	...
			R. 2	...	2									
Supa	...	...	P. 10	4	14	15	14	4	9	14	1	1	100·	100·
			R. 1	...	1									
Mundgod	...	...	P. 19	24	43	44	43	21	17	43	1	1	100·	100·
			R. ...	1	1									
Total ...	...	...	P. 421	367	788	108	788	291	313	718	76	56	91·12	73·68
			R. 52	24	76									
Ratnagiri Collectorate.														
Dápoli	...	...	P. 73	69	142	164	142	110	31	142	22	14	100·	63·64
			R. 17	5	22									
Vengurla	...	...	45	39	84	84	84	13	10	23	...	...	27·38	...
Total ...	...	...	P. 118	108	226	124	226	123	41	165	22	14	73·01	63·64
			R. 17	5	22									
Kolába Collectorate.														
Alibág	...	...	83	68	151	151	153	77	69	146	...	...	96·49	...
Pen	...	...	P. 14	13	27	28	27	18	8	26	1	...	96·29	...
			R. 1	...	1									
Mahád	...	...	76	62	138	138	146	35	88	123	...	...	89·13	...
Total ...	...	...	P. 173	143	316	317	326	130	165	295	1	...	93·35	...
			R. 1	...	1									
Thána Collectorate.														
Panvel	...	...	P. 38	38	76	77	76	25	46	75	1	1	98·68	100·
			R. ...	1	1									
Uran	...	...	10	19	29	29	29	23	3	26	...	...	89·66	...
Thána	...	...	P. 27	22	49	194	49	25	17	49	145	34	100·	23·45
			R. 94	51	145									
Bándra	...	...	P. 309	301	610	959	615	250	314	585	250	56	95·90	16·94
			R. 121	228	349									
Bhiwandi	...	...	38	19a	57	57	57	21	28	51	...	...	89·47	...
Chinchni	...	...	64	52	116	116	116	38	71	114	...	...	98·28	...
Kúrla	...	...	P. 274	223	497	531	497	115	237	352	34	...	70·82	...
			R. 25	9	34									
Bassein	...	...	P. 109	104	213	216	213	93	94	198	3	2	92·96	66·66
			R. 1	2	3									
Máhim	...	...	77	70	147	147	150	61	83	146	...	...	99·32	...
Mátherán	...	...	11	9	20	20	20	2	13	15	...	...	75·00	...
Sháhpur	...	...	P. 50	70	120	124	120	44	69	119	4	4	99·17	100·
			R. 4	...	4									
Total ...	...	...	P. 1,007	927	1,934	225	1,942	697	975	1,730	537	97	89·45	18·10
			R. 245	291	536									
Native States.														
Sávantvádi State ...	...	...	P. 180	165	345	604	345	111	175	299	239	166	86·67	64·09
			R. 219	40	259									
TOTAL FOR THE KONKAN REGISTRATION DISTRICT	...	...	P. 1,899	1,716	3,609	180	3,627	1,352	1,669	3,207	895	333	88·86	37·25
			R. 534	360	894									

Statement No. III, showing Dispensary Vaccination, &c.—*continued.*

Districts.	Number of Dispensaries in each District in which a Vaccinator is employed.	Average Number of Vaccinators attached to Dispensaries during the Season.	Total Number of Persons vaccinated.			Average Number of Persons vaccinated by each Vaccinator.	Primary Vaccination.				Revaccination.		Percentages of Successful Cases.	
								Successful.						
							Total.	Under 1 year.	1 and under 6.	Total of all Ages.	Total.	Successful.	Primary.	Revaccination.
1	2	3	4			5	6	7	8	9	10	11	12	13
Bombay City. THE PRESIDENCY CIRCLE.			Males.	Females.	Total.									
Her Majesty's Common Jail	...	...	P. 3 / R. 196	10	3 / 206	209	3	...	...	...	206	36	...	17·48
Her Majesty's House of Correction	...	...	P. 1 / R. 132	...	1 / 132	133	1	...	...	1	132	23	100·	17·42
TOTAL FOR THE PRESIDENCY CIRCLE	...	...	P. 4 / R. 328	10	4 / 338	171	4	...	...	1	338	59	25·00	17·46
Surat Collectorate. THE EASTERN GUJARAT REGISTRATION DISTRICT.														
Olpád	...	...	P. 3 / R. 1	4	7 / 1	8	7	1	6	7	1	1	100·	100·
Rander	...	...	160	152	312	312	217	95	312	...	...	...	100·	...
Bárdoli	...	...	96	102	198	198	110	78	189	...	...	...	95·45	...
Chikhli	...	...	7	13	20	20	16	4	20	...	...	...	100·	...
Bulsár	...	...	P. 143 / R. 26	174	317 / 26	343	317	109	186	302	26	10	95·27	38·46
Párdi	...	...	38	37	75	75	75	51	17	68	...	...	90·67	...
Kalliawari	...	...	81	77	158	158	158	78	67	152	...	...	96·20	...
Total	...	...	P. 528 / R. 27	559	1,087 / 27	159	1,087	582	453	1,050	27	11	96·69	40·74
Broach Collectorate. Ankleswar	...	...	10	6	16	16	16	10	1	11	...	...	68·75	...
Hánsot	...	...	24	23	47	47	47	24	10	34	...	...	72·34	...
Iláv	...	...	31	35	66	66	67	61	3	64	...	...	96·97	...
Jambusar	...	...	115	125	240	240	240	123	102	225	...	...	93·75	...
Total	...	...	180	189	369	92	370	218	116	334	...	...	90·54	...
Kaira Collectorate. Dákor	...	...	62	49	111	111	111	79	28	108	...	...	97·30	...
Kapadvanj	...	...	164	184	348	348	348	226	101	328	...	...	94·25	...
Borsad	...	...	184	147	331	331	335	253	58	311	...	...	93·96	...
Mehmadabad	...	...	124	119	243	243	243	215	18	233	...	...	95·88	...
Mahudha	...	...	132	81	213	213	213	79	124	206	...	...	96·71	...
Kaira Jail	...	...	121	8	129	129	129	1	...	129	...	...	100·	...
Total	...	...	787	588	1,375	229	1,379	853	329	1,215	...	...	95·64	...
Panch Mahals. Godhra	...	...	P. 176 / R. 4	142 / 1	318 / 5	323	318	273	45	318	5	5	100·	100·
Ahmedabad Collectorate. Dholera	...	...	65	64	129	129	129	58	61	119	...	...	92·25	...
Sánand	...	...	64	64	128	128	131	111	12	123	...	...	96·09	...
Parántij	...	...	P. 81 / R. 1	57	138 / 1	139	138	92	34	126	1	1	91·30	100·
Khárágboda	...	...	P. 8 / R. 2	2	10 / 2	12	10	..	...	...	2	...	...	...
Total	...	...	P. 218 / R. 2	187	405 / 3	102	408	261	107	368	3	1	90·86	33·33
Mahi Kántha Agency. Sadra	...	...	P. 87 / R. 17	89	176 / 17	193	176	156	11	167	17	9	94·89	52·94
TOTAL FOR THE EASTERN GUJARÁT REGISTRATION DISTRICT	...	...	P. 1,976 / R. 31	1,754 / 1	3,730 / 32	164	3,738	2,343	1,061	3,552	52	26	95·23	50·00

Statement No. III, showing Dispensary Vaccination, &c.—*continued.*

Districts.	Number of Dispensaries in each District to which a Vaccinator is attached.	Average Number of Vaccinators employed in the Dispensaries during the Season.	Total Number of Persons vaccinated.			Average Number of Persons vaccinated by each Vaccinator.	Primary Vaccination.				Revaccination.		Percentage of Successful Cases	
							Total.	Successful.			Total.	Successful.	Primary.	Revaccination.
								Under 1 year.	1 and under 6.	Total of all Ages.				
1	2	3	4			5	6	7	8	9	10	11	12	13
Kathiawar.	**THE WESTERN GUJARAT CIRCLE.**		Males.	Females.	Total.									
	Wadhwán	...	60	45	105	105	110	70	17	87	...	...	82·86	...
	Songad	...	...	4	4	4	4	3	1	4	...	...	100·	...
	Mánekváda	...	10	7	17	17	17	14	3	17	...	...	100·	...
	Rájkot	...	R. 106	6	112	112	...	...	...	...	112	21	...	18·75
	Total	...	P. 70	56	126	59	131	87	21	108	112	21	85·71	18·75
			R. 106	6	112									
Native States.	Gondal	...	P. 233	204	437	439	437	310	116	426	2	2	97·48	100·
			R. 2	...	2									
	Upleta	...	162	149	311	311	311	189	117	308	...	...	99·04	...
	Dhoraji	...	126	135	261	261	261	223	38	261	...	...	100·	...
	Bhávnagar	...	72	68	140	140	140	114	21	135	...	...	96·42	...
	Limbdi	...	P. 209	182	391	398	391	312	59	371	7	6	94·88	85·71
			R. 5	2	7									
	Sársai	...	11	17	28	28	28	24	3	27	...	...	96·43	...
	Total	...	P. 813	735	1,568	263	1,568	1,172	354	1,528	9	8	97·45	88·88
			R. 7	2	9									
	TOTAL FOR THE WESTERN GUJARAT CIRCLE	...	P. 883	811	1,694	181	1,699	1,259	375	1,636	121	29	96·58	23·97
			R. 113	8	121									
Karáchi Collectorate.	**THE SIND REGISTRATION DISTRICT.**													
	Keti Bandar	...	P. 53	45	98	105	98	36	44	82	7	7	83·67	100·
			R. 6	1	7									
	Mirpur Batoro	...	P. 19	27	46	57	47	39	3	42	11	10	91·30	90·91
			R. 11	...	11									
	Tatta	...	P. 157	123	280	299	280	86	56	142	19	1	50·71	5·26
			R. 14	5	19									
	Jerruck	...	P. 33	20	53	80	53	27	6	47	27	22	88·68	81·48
			R. 27	...	27									
	Sehwan	...	31	17	48	48	48	15	20	42	...	...	87·50	...
	Total	...	P. 293	232	525	118	526	203	129	355	64	40	67·62	62·50
			R. 58	6	64									
Hyderabad Collectorate.	Tháru Sháh	...	18	20	38	38	38	16	17	33	...	...	86·84	...
	Hála	...	58	64	122	122	122	64	54	119	...	...	97·54	...
	Alahyar-jo-Tando	...	P. 69	42	111	115	113	72	31	103	4	3	92·79	75·00
			R. 4	...	4									
	Tando	...	P. 83	76	159	165	160	48	65	120	6	5	75·47	83·33
			R. 6	...	6									
	Tando Bago	...	P. 31	20	51	75	51	31	18	49	24	17	96·08	70·83
			R. 4	20	24									
	Tando Adam	...	P. 75	39	114	116	114	35	52	91	2	...	79·82	...
			R. 2	...	2									
	Mirpur Khás	...	P. 17	14	31	76	31	22	7	30	45	19	96·77	42·22
			R. 45	...	45									
	Total	...	P. 345	281	626	101	629	288	244	545	81	44	87·06	54·32
			R. 61	20	81									
Thar and Parkar.	Nagar Párkar	...	P. 43	45	88	95	90	53	27	86	8	3	97·73	42·86
			R. 2	5	7									
	Mitti	...	26	21	47	47	47	38	8	47	...	...	100·	...
	Umarkot	...	P. 51	42	93	96	94	63	16	80	3	...	85·02	...
			R. 3	...	3									
	Khipra	...	P. 9	9	18	23	18	12	3	18	5	3	100·	60·00
			R. 4	1	5									
	Total	...	P. 129	117	246	65	249	166	54	231	16	6	93·20	40·00
			R. 9	6	15									

Statement No. III, showing Dispensary Vaccination, &c.—*continued*.

Districts.		Number of Dispensaries in each District to which a Vaccinator is attached.	Average Number of Vaccinators employed in Dispensaries during the year.	Total Number of Persons vaccinated.			Average Number of Persons vaccinated by each Vaccinator.	Primary Vaccination.				Revaccination.		Percentage of Successful Cases.	
								Total.	Successful.			Total.	Successful.	Primary.	Revaccination.
									Under 1 year.	1 and under 6.	Total of all Ages.				
1		2	3	4			5	6	7	8	9	10	11	12	13
				Males.	Females.	Total.									
Shikarpur Collectorate.	THE SIND REGISTRATION DISTRICT—*continued*.														
	Rohri	...	...	P. 171 R. 4	144 237	315 241	556	315	272	36	308	241	20	97·78	8·30
	Mehar	...	...	11	8	19	19	19	13	2	15	...	...	78·95	...
	Total ...	...	...	P. 182 R. 4	152 237	334 241	287	334	285	38	323	241	20	96·71	8·30
Mekran Coast.	Gundar	...	...	P. 343 R. 17	340 18	683 35	718	695	8	204	511	35	9	74·82	25·71
	TOTAL FOR THE SIND REGISTRATION DISTRICT	...	...	P. 1,292 R. 149	1,122 287	2,414 436	150	2,433	950	669	1,965	437	119	81·40	27·29
Native States.	THE BARODA CIRCLE.														
	Sojitra	...	...	98	90	188	188	188	141	45	188	...	...	100·	...
	Dabhoi	...	...	46	57	103	103	103	97	6	103	...	...	100·	...
	Padra	...	...	109	67	176	176	176	169	4	173	...	...	98·30	...
	Patan	...	...	261	226	487	487	487	364	122	486	...	...	100·	...
	Degam	...	...	85	92	177	177	177	168	8	176	...	...	99·43	...
	Visnagar	...	...	246	226	472	472	472	349	123	472	...	...	100·	...
	Vadnagar	...	...	145	130	275	275	275	215	55	270	...	...	98·18	...
	Vijapur	...	...	98	87	185	185	185	137	48	185	...	...	100·	...
	Gandevi	...	...	104	92	196	196	196	165	23	188	...	...	95·92	...
	Bet	...	...	80	59	139	139	139	40	80	139	...	...	100·	...
	Amreli	...	...	299	290	589	589	592	434	126	562	...	...	95·42	...
	Okha (Battalion Hospital) ...	...	...	9	7	16	16	16	4	12	16	...	...	100·	...
	Damnagar	...	...	57	43	100	100	101	55	44	100	...	...	100·	...
	Dhari ... (Battalion Hospital). (Dispensary)	...	...	2	...	2	2	2	1	1	2	...	...	100·	...
		...	...	10	10	20	20	20	20	...	20	...	...	100·	...
	Kadi	...	...	139	127	266	266	276	234	31	265	...	...	100·	...
	Sidhpur	...	...	149	139	288	288	288	215	52	269	...	...	93·40	...
	Vyara	...	...	3	4	7	7	7	7	...	7	...	...	100·	...
	Dwarka	...	...	32	27	59	59	59	23	36	59	...	...	100·	...
	TOTAL FOR THE BARODA CIRCLE...	...	...	1,972	1,773	3,745	197	3,759	2,838	816	3,682	...	...	98·32	...
BASSADORE		...	...	4	3	7	7	7	2	1	3	...	...	42·86	...
BUSHIRE		...	...	60	28	88	88	88	40	36	76	...	...	86·36	...
MUSCAT		...	...	174	97	271	271	272	47	74	256	...	...	94·46	...
TOTAL FOR THE	BRITISH TERRITORY	...	...	P. 10,229 R. 875	9,187 634	19,446 1,509	189	19,511	10,322	6,603	17,810	1,511	414	91·68	27·44
	NATIVE STATES... ...	...	...	P. 4,899 R. 789	4,433 137	9,332 926	228	9,344	6,211	2,595	8,923	926	651	95·70	70·30
GRAND TOTAL FOR THE BOMBAY PRESIDENCY...		...	...	P. 15,150 R. 1,664	13,620 771	28,770 2,435	200	28,855	16,533	9,198	26,733	2,437	1,065	92·92	43·74

Comparative Statement No. IV, showing the Number of Persons Primarily Vaccinated and the Number of those Persons who were Successfully Vaccinated in each of the undermentioned official years.

Establishments.	Persons primarily vaccinated.																			
	Years ended 31st March.																			
	1874.		1875.		1876.		1877.		1878.		1879.		1880.		1881.		1882.		1883.	
	Total Number.	Number successfully vaccinated.	Total Number.	Number successfully vaccinated.	Total Number.	Number successfully vaccinated.	Total Number.	Number successfully vaccinated.	Total Number.	Number successfully vaccinated.	Total Number.	Number successfully vaccinated.	Total Number.	Number successfully vaccinated.	Total Number.	Number successfully vaccinated.	Total Number.	Number successfully vaccinated.	Total Number.	Number successfully vaccinated.
Government	3,208	2,867	4,517	4,365	4,706	4,552	5,518	5,346	5,472	5,311	4,630	4,444	3,274	3,229	4,130	3,980	5,563	5,497	5,266	5,225
Municipal	51,313	44,129	54,810	51,162	59,392	55,698	61,671	58,300	50,230	46,355	42,211	39,129	48,318	45,009	49,857	47,361	54,726	52,225	65,308	61,862
Local Fund	357,162	326,852	377,538	361,689	375,202	364,503	394,775	382,211	340,998	326,670	304,429	292,640	322,871	312,124	347,194	337,392	379,008	369,913	419,822	407,635
Cantonment	1,103	999	969	906	1,018	963	827	771	845	804	872	846	939	939	967	967	1,060	1,060	1,471	1,450
Native State	188,788	171,657	209,689	195,729	224,730	211,316	242,391	226,402	246,773	228,333	188,447	174,757	188,196	175,979	213,411	202,210	257,752	246,565	266,280	254,072
Dispensary	18,560	16,403	19,393	17,463	19,954	18,156	19,996	18,486	20,201	17,904	17,887	16,233	19,119	17,406	22,732	21,009	26,813	25,050	28,770	26,733
Army { European	1,122	1,122	728	728	825	825	1,973	1,973	1,313	1,313	494	453	635	604	659	610	571	434	402	390
Army { Native	4,562	4,246	4,153	3,940	4,812	4,541	5,033	4,659	4,203	3,920	3,008	2,719	3,049	2,499	3,555	2,984	3,830	3,179	4,987	4,438
Total	625,818	568,275	671,817	635,982	690,639	660,556	732,184	698,148	670,055	630,590	561,969	531,221	586,501	557,840	642,505	616,513	729,323	703,923	792,206	761,745

Note.—Revaccinations are wholly excluded from this Statement.

No. 4325.

GENERAL DEPARTMENT.

Bombay Castle, 23rd November 1883.

Letter from the Sanitary Commissioner, No. 1963-B., dated 30th June 1883—Submitting Mr. Lumsdaine's annual report of the Sanitary Department for 1882.

RESOLUTION.—*Vital Statistics.*—The total number of births registered during the year 1882 amongst the civil population of the Bombay Presidency was 491,346, which is higher by 31,689 than that for 1881 and exceeds by 181,342 the mean total for the previous nine years. The general ratio of births registered in the year to the population was 29·86 per 1,000, which is higher by 1·93 than that for 1881 and exceeds by 10·76 the mean rate of the preceding nine years. The proportion of female to male births registered was 91·98 to 100, and was the highest recorded since 1872. As compared with 1881 there was an increase in the number of births registered in 15 out of the 24 registration districts into which the Presidency is divided, the remaining 9 districts, in which there was a decrease, being those named in the margin. As compared with the average figures for the nine years preceding 1881 there was an increase in all districts, a result mainly due to improved registration. There is however, as pointed out by the Sanitary Commissioner, much room for further improvement, and His Excellency the Governor in Council trusts no efforts will be spared by the District Officers to make the returns more reliable. The largest number of births recorded (43,114) was in the Khándesh District, which according to the census of 1881 contains the largest population in the Presidency, but the highest rate is for the district of Dhárwár, viz., 41·06 per mille, and the lowest, 10·51, for the Upper Sind Frontier, which however is higher than the rate, 7·55, in the same district in 1881. The districts in which after Dhárwár the proportion of births registered to the population was highest are Ahmednagar, Sátára, Belgaum, Surat, Kaládgi, Násik, Khándesh, Sholápur and Kaira, in all of which the rate exceeded 32 per mille. The most marked decrease in the ratio of births registered during the year under review to the population occurred in the Panch Maháls—26·67 as compared with 40·03 recorded last year. From these violent fluctuations it is clear that no inferences except that the registration is seriously inaccurate could safely be drawn from the figures. The ratio of births registered to the population exceeded that of the deaths in all districts except Hyderabad, Shikárpur and the City of Bombay. The excess was greatest in Ahmednagar (39·12 against 19·51), Sholápur (34·57 against 18·99), Sátára (39·06 against 22·62), Dhárwár (41·06 against 22·58) and Kaládgi (35·52 against 19·10). The deduced birth-rate and death-rate for the whole Presidency were 29·86 and 20·87 respectively. The figures given by the Sanitary Commissioner for the 24 principal towns show that in 12 the ratio of births registered to the population was lower than the ratio of deaths. There appears to be little doubt that registration in these towns is still very imperfect, and that even in the City of Bombay, where a special establishment is entertained for the purpose, there has been little improvement. This subject has been treated of in paragraph 31 of Government Resolution No. 1511, dated 4th May 1883, reviewing the Municipal Administration Reports for the year 1881-82, and the attention of all Collectors should be called to the repeated instructions of Government regarding the introduction into Municipal towns of bye-laws rendering the registration of births and deaths obligatory.

Thána.	Ahmedabad.
Broach.	Kánara.
Kaira.	Hyderabad.
Panch Maháls.	Thar and Párkar.

City of Bombay.

2. The total number of deaths registered among the civil population was 343,418 (181,835 males and 161 583 females) as compared with 381,450 in 1881 or at the rate of 20·87 per 1,000 as compared with 23·18. The proportion of deaths of females registered to deaths of males registered was 100 to 112·53. The deduced death-rate for males exceeded that for females in all the districts except Shikárpur and the City of Bombay. The highest ratio, 22·20 per mille, was recorded in Gujarát, and the lowest in Sind, 17·54. In all the divisions except Sind the ratio of deaths registered was lower in 1882 than in the preceding year. As in the case of births the largest number of deaths (27,304) was registered in the Khándesh District, and the lowest (1,230) in the Upper Sind Frontier. The highest death-rate, 26·16 per 1,000, for any one district is returned for the City of Bombay, and the lowest, 9·90, for the Upper Sind Frontier. The proportion of deaths registered of infants under 1 year to the total number of deaths was 22·11, and of those of 50 years of age 20·12. The following table gives the ratio of deaths registered of people of different religions for the years 1881 and 1882 :—

	Population according to the census of 1881.	Per mille.	
		1881.	1882.
Mahomedans	3,106,482	16·68	17·88
Hindus	13,128,729	24·66	21·49
Christians	138,326	12·06	18·29
Others	80,877	48·03	39·17.

The maximum rate of mortality (1·99) was in the month of November and the minimum (1·46) in June, while in 1881 the months in which there were respectively most and fewest deaths were August and May. As was the case in 1881 the ratio per mille (26·20) was highest for the town population; for the population of rural circles and of cantonments the ratios were 20·13 and 17·11 respectively.

3. *Chief Diseases.*—The number of deaths resulting from the chief diseases and the proportion per mille of population in each case are shown in the following table :—

Diseases or injury.	Number of deaths.	Ratio of deaths per 1,000 of population.
Cholera	7,904	0·48
Small-pox	1,630	0·10
Fever	243,454	14·80
Bowel-complaints	28,353	1·72
Injuries	5,913	0·36
Other causes	56,164	3·41
Total	343,418	20·87.

The deaths from cholera during the year under review were 7,904 as compared with 16,694 in the previous year, and an average for the past 16 years of 19,955. The ratio of deaths to 1,000 of population was 0·48 and to deaths from all causes 2·3 per cent. as compared with 1·01 and 4·4 respectively in 1881. During the rainy season consisting of 122 days a large number of deaths from cholera (3,846) was registered and the greatest number in any one month was recorded in May. The Districts of Kánara and Panch Mahals and all the districts of Sind except Thar and Párkar were entirely free from the disease during the year under review. The disease was most virulent in Sátára, Belgaum and Thána, in which districts the numbers of deaths recorded as resulting from it were 2,406, 1,334 and 774 respectively. The percentage of deaths to attacks was 47·40 or nearly the same as in 1881. 190 deaths from cholera were registered in the City of Bombay, the average for the past 34 years being 1,426. In the tálukás noted in the margin the ratio of deaths from cholera to the population exceeded 3 per mille. The highest ratio in towns was in Gokák (15·81 per 1000), Kapadvanj (9·62), Pandharpur (3·31), and Viramgám (3·11). In most of the districts in which the disease prevailed the cause of the outbreak has been attribu-

Válva in Sátára.
Panvel in Thána.
Khánápur in Sátára.
Viramgám in Ahmedabad.
Chikodi in Belgaum.

ted to defective sanitation, particularly bad drainage. On this subject Government desire to invite the attention of the District Officers and the City Municipalities to the "Revised Suggestions of the Army Sanitary Commission for the improvement of Indian towns and villages," recently circulated.

4. During the year under review 1,630 deaths were reported as having occurred from small-pox, showing a considerable increase over the figures for 1880 and 1881, which were 940 and 539 respectively. The districts entirely free from this disease were Broach and Upper Sind Frontier. The greatest number of deaths from small-pox, 506, was registered in the Poona District. The mortality was highest in the Northern Deccan, 679, and lowest in the Southern Deccan, 70. Of the total number of deaths from this disease, 311 were among infants under 1 year, 563 among children above 1 year and under 12, and 756 among adults over 12 years of age.

5. The number of deaths recorded as having resulted from fever was 243,454, showing a decrease of 28,949 as compared with the previous year. The ratio of deaths from fever to 1,000 of population was highest in Shikárpur (19·66), and lowest (7·01) in the City of Bombay. There was a diminution during the year in the loss of life from fever in every division and in every district of the Presidency except in Sind, where this disease was most prevalent. The figures for Sind for the years 1881 and 1882 are 27,575 and 37,785 respectively.

6. There were 28,352 deaths registered during the year under review under the head "bowel complaints" as compared with 30,342 in 1881. The highest mortality was reported in Khándesh (4,206), and the lowest in Thar and Párkar (8). The deaths recorded as due to this cause were most numerous in the Southern Deccan and fewest in Sind.

7. During the year under review 5,913 deaths were reported from injuries as compared with 5,950 in 1881. The deaths from each kind of injury as compared with those of the preceding year were as follow:—

	1882.	1881.
Drowning	2,642	2,636
Poisoning	103	113
Hanging	214	217
Wounding	361	382
Wild beasts	71	120
Snake-bites	1,277	1,209
Other causes	1,245	1,273
Total	5,913	5,950.

Of the total number of deaths from injuries in 1882, which is less than any reported since 1873, 685 were suicidal as compared with 723 in 1881. 424 persons committed suicide by drowning, 56 by poisoning, 195 by hanging and 10 by wounding. Deaths from snake-bite were, as usual, most frequent in the rainy season, 190, 149 and 156 deaths respectively being recorded as due to this cause in the Districts of Hyderabad, Ratnágiri and Thána. It is much to be regretted that notwithstanding the expenditure which has been incurred in rewards for the destruction of venomous snakes the number of deaths recorded as resulting from snake-bite in the year under review was greater than in any year since 1877. Efforts should be made to induce Municipalities to offer larger rewards for the destruction of poisonous reptiles.

8. In the report under review 1,348 deaths are said to have been caused by wild beasts including snakes, while the returns disposed of by Government Resolution No. 3051, dated 21st August 1883, show the number for the same year as 1,265. This discrepancy should be brought to the notice of the Sanitary Commissioner.

9. *Vaccination.*—The figures under this section of the report are given for the financial year. There were 455 vaccinators employed during the year 1882-83, showing an increase of 23 over the strength of the previous year. Of these,

39 were Municipal vaccinators and 248 Local Fund vaccinators; the rest were for the most part employed in Native States. It is stated that additional vaccinators are required in some of these States. The Local Fund Committees in the Collectorates of Poona, Sátára, Karáchi, Ratnágiri and Ahmednagar have agreed to maintain on the permanent establishment a candidate vaccinator on a salary of Rs. 5 per mensem. There are no candidate vaccinators in the Collectorates of Khándesh, Násik and Panch Mahals, but it is hoped that the Local Fund Committees of these districts will sanction their employment as soon as the state of their funds permits.

10. 792,206 persons (409,054 males and 383,152 females) were primarily vaccinated and 66,505—of whom 41,058 were males and 25,447 females—revaccinated during the year under review as compared with 729,323 and 56,769 persons respectively in the previous year. The increase of 72,619 in the number of operations is satisfactory. Except in Sind, the Aden Circle and the British Army, fair progress was made in both kinds of operations in all districts. 5,519 Christians, 600,206 Hindus, 126,734 Mahomedans, 2,635 Pársis and 57,112 persons of other castes were primarily vaccinated. Of the total number so vaccinated, 61·30 per cent. were under 1 year old, 35·87 over 1 and under 6 years and 2·83 per cent. above 6 years. 96·15 per cent. cases of primary vaccination proved successful, 1·57 unsuccessful and the results of 2·34 were not known. Of the cases of re-vaccination, 69·80 per cent. were successful, 19·16 unsuccessful and the result of 11·04 was not known. Throughout the whole Presidency each vaccinator on an average vaccinated 1,880 persons as compared with 1,751 last year. Out of 31 infants which are calculated to be available for vaccination among every 1,000 of population, 29·74 per mille were primarily vaccinated with successful results as compared with 27·48 last year. This increase indicates a fair improvement both in the quantity and quality of the work performed. The steady increase in the number of children successfully vaccinated in the Presidency Circle tends to prove that the "Bombay Vaccination Act, 1877," has been satisfactorily worked. The proposal of the Superintendent of the Presidency Circle that candidate vaccinators should be trained in Bombay before they are sent to the districts seems worthy of consideration.

11. Animal vaccination continued to be practised in Bombay, Poona and Poona Cantonment; in Broach, Nadiád, Ankleshvar and Hánsot it was introduced about the close of the year, while in Karáchi it has been discontinued since July 1882 on account of the refusal of the Municipality to undertake the cost of the inoculation of heifers. The quality of the lymph received from England, which was used throughout the Presidency, was found to be generally good. The total expenditure on account of vaccination for the whole Presidency was Rs. 2,68,285-13-3½, which exceeded by Rs. 7,929-15-1½ the cost of the previous year. The average cost for each successful case was annas 5-7, or 3 pies less than in 1881-82. The results of the year under review are creditable to the officers concerned.

12. *Sanitary Works, Military.*—The expenditure on sanitary works, military, incurred in the year 1882 amounted to Rs. 1,19,036 as compared with Rs. 4,22,109 in 1881. The scheme for the improvement of the water-supply of Nasirabad from the Dánta Reservoir at an estimated cost of Rs. 2,76,671 has not been completed, but a large sum, Rs. 2,43,061, was spent on the work in the year 1881, and Rs. 3,119 in 1882. Rs. 36,977 were expended on the construction of a hospital for British troops at Ahmedabad. Sums exceeding Rs. 10,000 were expended on sanitary improvements at Aden, Poona and Mhow and smaller amounts were expended at 18 other military cantonments on minor works. This portion of the report will, as usual, be considered by Government in the Military Department.

13. *Sanitary Works, Civil.*—This section contains information about the sanitary condition of all Municipal towns abstracted from the reports of the Municipalities for 1881-82, which have already been reviewed.

14. *General Remarks.*—Under this head an account is given of the inspection of some of the encampments of British troops in the Presidency by

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Mr. Lumsdaine and his successor, Mr. Howlett. The Ghorpuri Lines at Poona have been reported to be unhealthy, malarial fevers having prevailed amongst the regiments quartered there. This subject will doubtless receive attention from the committee which has been appointed by Government Resolution No. 3084, dated 22nd August 1883, to report on the sanitary condition of the villages of Ghorpuri, Wanowri and Bhámburda. The report on Aden has been already reviewed in Government Resolution No. 511, dated 12th February 1883. Dr. Howlett's reports on the sanitary condition of the cantonments of Nasirabad, Nimach and Mhow will be considered by Government in the Military Department. The Sanitary Commissioner has made some valuable observations regarding the City Night-soil Depôt, Poona, in paragraph 37, Section 6 of the report, to which the attention of the Poona City Municipality should be invited.

15. In reviewing the Sanitary Commissioner's report for 1881, which Mr. Lumsdaine expected to be the last which would be submitted by him, His Excellency the Governor in Council expressed his appreciation of the good work performed by that officer. The report now under review which was prepared by Mr. Lumsdaine on the eve of his retirement evinces the keen interest which he continued to take in the administration of the Sanitary Department. The other officers of the department deserve praise for the zeal and energy displayed by them in the performance of their duties.

J. MONTEATH,
Acting Under Secretary to Government.

To

The Sanitary Commissioner,
The Surgeon General with the Government of Bombay,
The Military Department of the Secretariat,
The Judicial Department of the Secretariat,
The Revenue Department of the Secretariat,
The Political Department of the Secretariat,
The Public Works Department of the Secretariat,
The Commissioner in Sind,
The Commissioner, N. D., } With copies of
The Commissioner, C. D., } the report.
The Commissioner, S. D.,
All Collectors, including the Collectors and Deputy Commissioners in Sind,
The Municipal Commissioner for the City of Bombay,
The Compiler of the Bombay Gazetteer,
The Compiler, General Administration Report for 1882-83,
The Accountant General.

The Secretary of State,
The Government of India. } By letter.